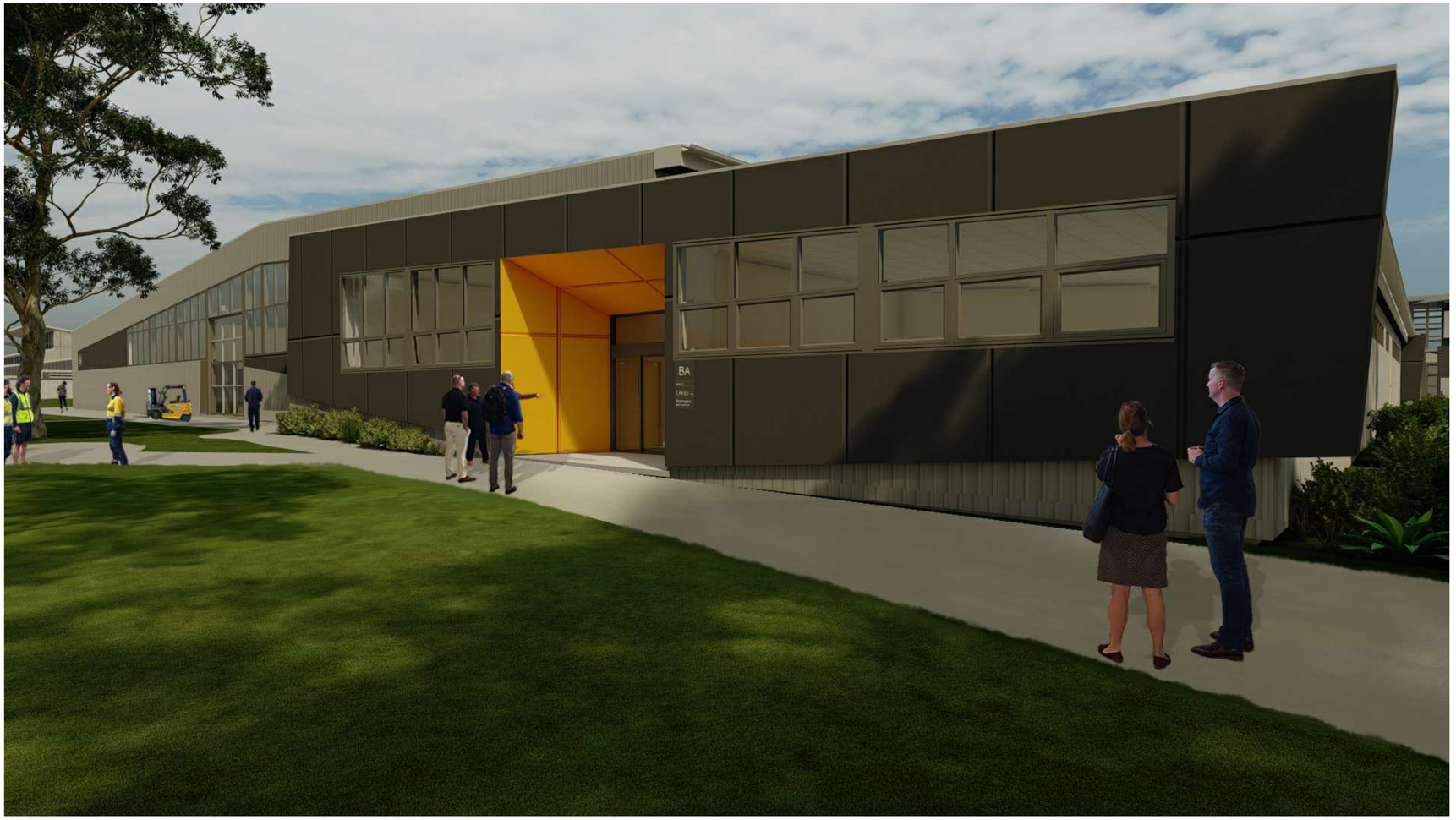


Wollongbar TAFE Multi-Trades Hub

REVISED ISSUE FOR DA

TSA Riley

ARCHITECTURAL DRAWING LIST

NO.	TITLE	REV
A-000	COVERSHEET	G
A-010	LOCATION PLAN	M
A-011	SITE PLAN	N
A-015	DEMOLITION SITE PLAN	E
A-021	SITE ANALYSIS PLAN	F
A-022	STREET VIEW ANALYSIS	G
A-030	MATERIALS AND FINISHES SCHEDULE	E
A-100	GENERAL ARRANGEMENT FLOOR PLAN	N
A-105	ROOF PLAN	K
A-110	REFERENCE PLAN OVERALL	G
A-111	REFERENCE PLAN AMENITIES & CORRIDOR 2	F
A-200	ELEVATIONS - SOUTH & WEST	K
A-201	ELEVATIONS - NORTH & EAST	K
A-300	SECTIONS AA, BB, CC & DD	L
A-301	SECTIONS EE, FF, GG & HH	L
A-302	SECTIONS JJ, KK, LL & MM	L

BUILDING AND SITE INFORMATION

ADDRESS
61 Sneaths Road, Wollongbar, NSW

CLIENT
TAFE NSW

BUSHFIRE ZONE
-

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

ACN 002 512 843 I **ABN** 82 644 649 849 Nominated Architect - Bernard Collins NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300 **P** +61 2 4929 2353 I **F** +61 2 4926 3069 I **E** mail@eje.com.au I **W** www.eje.com.au

0 20mm 100mm 200mm ON ORIGINAL B1

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	15-10-2024	PRE-DA ISSUE	CdV/SG	TH	
B	12-12-2024	PRELIMINARY DA ISSUE	CdV	TH	
C	18-12-2024	REVISED ISSUE FOR COORDINATION	CdV	TH	
D	20-12-2024	SCHEMATIC DESIGN ISSUE	CdV	TH	
E	15-01-2025	ISSUED FOR DA	CdV	TH	
F	30-01-2025	ISSUE FOR COORDINATION	CdV	TH	
G	25-02-2025	REVISED ISSUE FOR DA	CdV	TH	

PROJECT : Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW

Bundjalung Country

CLIENT : TAFE NSW

DRAWING : COVERSHEET

DRAWN : CdV
DATE : OCT 2024
SCALES : @ B1

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT No : 15223
PHASE : SD
DRAWING No : A-000
REV : G

EJE

ACN 002 912 843 I **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 I **F** +61 2 4926 3069
E mail@eje.com.au I **W** www.eje.com.au

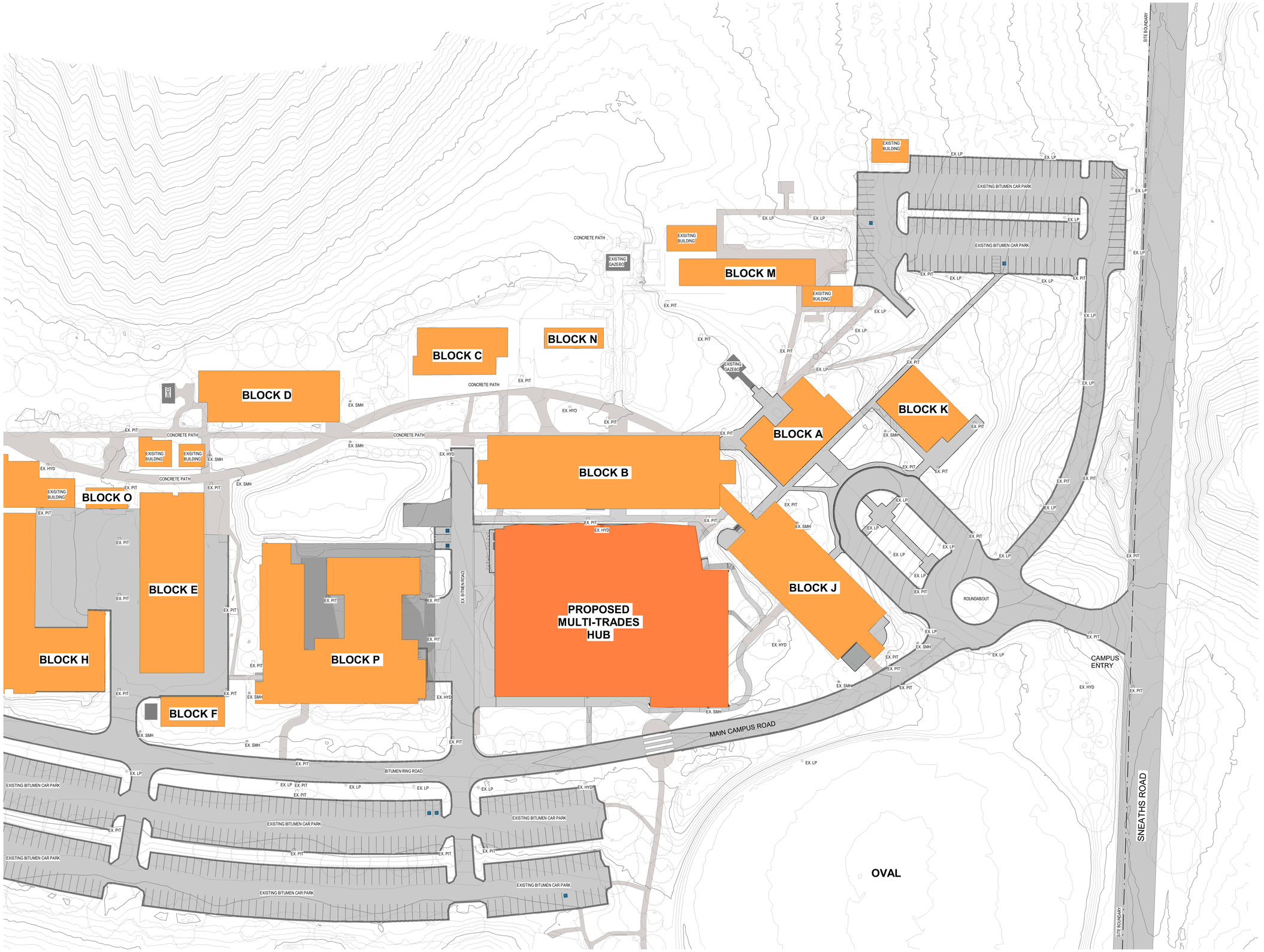
COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	28-05-2024	ISSUED FOR REVIEW	CdV	TH	
B	27-06-2024	ISSUE FOR INITIAL COSTING	CdV	TH	
C	08-08-2024	ISSUE FOR COST PLANNING	CdV	TH	
D	20-09-2024	CONCEPT DESIGN ISSUE	CdV	TH	
E	26-09-2024	CONCEPT DESIGN ISSUE	CdV	TH	
F	15-10-2024	PRE-DA ISSUE	CdV	TH	
G	29-10-2024	ISSUED FOR COORDINATION	CdV/SG	TH	
H	12-12-2024	PRELIMINARY DA ISSUE	CdV	TH	
J	20-12-2024	SCHEMATIC DESIGN ISSUE	Cdv	TH	
K	15-01-2025	ISSUED FOR DA	CdV	TH	
L	05-02-2025	ISSUED FOR COORDINATION	CdV	TH	
M	25-02-2025	REVISED ISSUE FOR DA	CdV	TH	

200mm ON ORIGINAL @1



CLIENT :

TAFE NSW

TSA Riley

DRAWING :

LOCATION PLAN

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

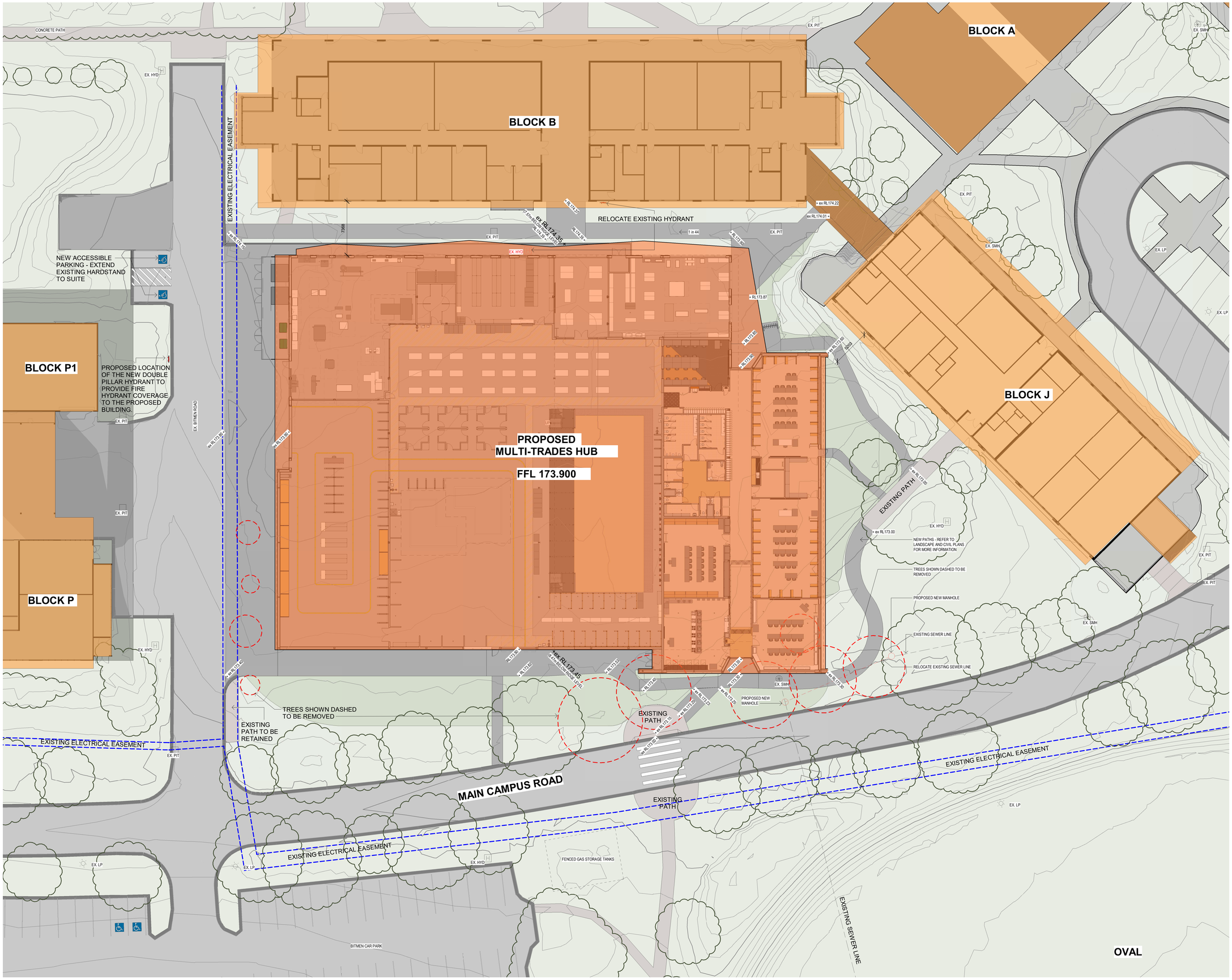
Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN :	PROJECT No :
SR	15223

SCALE :	DATE :
1 : 500 @ B1	MAY 2024

PHASE :	DRAWING No :	REV :
SD	A-010	M

EJE


BLOCK A
BLOCK B
BLOCK J
BLOCK P
BLOCK P1
PROPOSED MULTI-TRADES HUB
FFL 173.900
RELOCATE EXISTING HYDRANT
EXISTING ELECTRICAL EASEMENT
NEW ACCESSIBLE PARKING - EXTEND EXISTING HARDSTAND TO SUITE
PROPOSED LOCATION OF THE NEW DOUBLE PILLAR HYDRANT TO PROVIDE FIRE HYDRANT COVERAGE TO THE PROPOSED BUILDING.
TREES SHOWN DASHED TO BE REMOVED
EXISTING PATH TO BE RETAINED
MAIN CAMPUS ROAD
EXISTING PATH
EXISTING PATH
NEW PATHS - REFER TO LANDSCAPE AND CIVIL PLANS FOR MORE INFORMATION
TREES SHOWN DASHED TO BE REMOVED
PROPOSED NEW MANHOLE
EXISTING SEWER LINE
RELOCATE EXISTING SEWER LINE
PROPOSED NEW MANHOLE
FENCED GAS STORAGE TANKS
BITMEN CAR PARK
OVAL
CONCRETE PATH
EX. HYD
EX. PIT
EX. SMH
EX. LP
EX. BITMEN ROAD
1 in 44
ex RL174.35
ex RL174.22
ex RL174.01
ex RL173.87
ex RL173.00
ex RL173.30
ex RL173.80
ex RL173.85
ex RL173.40
ex RL173.20
ex RL173.15
ex RL173.25
ex RL173.52
ex RL173.54
ex RL173.61
ex RL173.67
ex RL173.45
ex RL173.60
ex RL173.50
ex RL173.90
ex RL174.37
ex RL174.56
ex RL174.90
ex RL174.40
ex RL174.60
ex RL173.60
ex RL173.80
ex RL173.85
ex RL173

BLOCK A

BLOCK B

BLOCK P1

BLOCK P

BLOCK J

EXISTING PATH
TO BE RETAINED

EXISTING HYDRANT
TO BE RELOCATED

PATHS SHOWN DASHED
TO BE DEMOLISHED

EXISTING TENNIS COURT
AND ROTUNDA TO BE
DEMOLISHED

TREES SHOWN DASHED
TO BE REMOVED

EXISTING PATH TO BE RETAINED

EXISTING PATH

MAIN CAMPUS ROAD

EX. BITMEN ROAD

EXISTING PATH
TO BE RETAINED

TREES SHOWN
DASHED TO BE
REMOVED

PATHS SHOWN DASHED
TO BE DEMOLISHED

EXISTING SEWER LINE TO
BE RELOCATED

EX. HYD

EX. PIT

EX. SMH

N

ACN 002 912 843 | **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 | **F** +61 2 4926 3069
E mail@eje.com.au | **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	12-12-2024	PRELIMINARY DA ISSUE	CdV	TH	
B	20-12-2024	SCHEMATIC DESIGN ISSUE	CdV	TH	
C	15-01-2025	ISSUE FOR DA	CdV	TH	
D	30-01-2025	ISSUE FOR COORDINATION	CdV	TH	
E	25-02-2025	REVISED ISSUE FOR DA	CdV	TH	

200mm ON ORIGINAL B1

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

DEMOLITION SITE PLAN

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN : SG

PROJECT No : 15223

SCALE : 1 : 200 @ B1

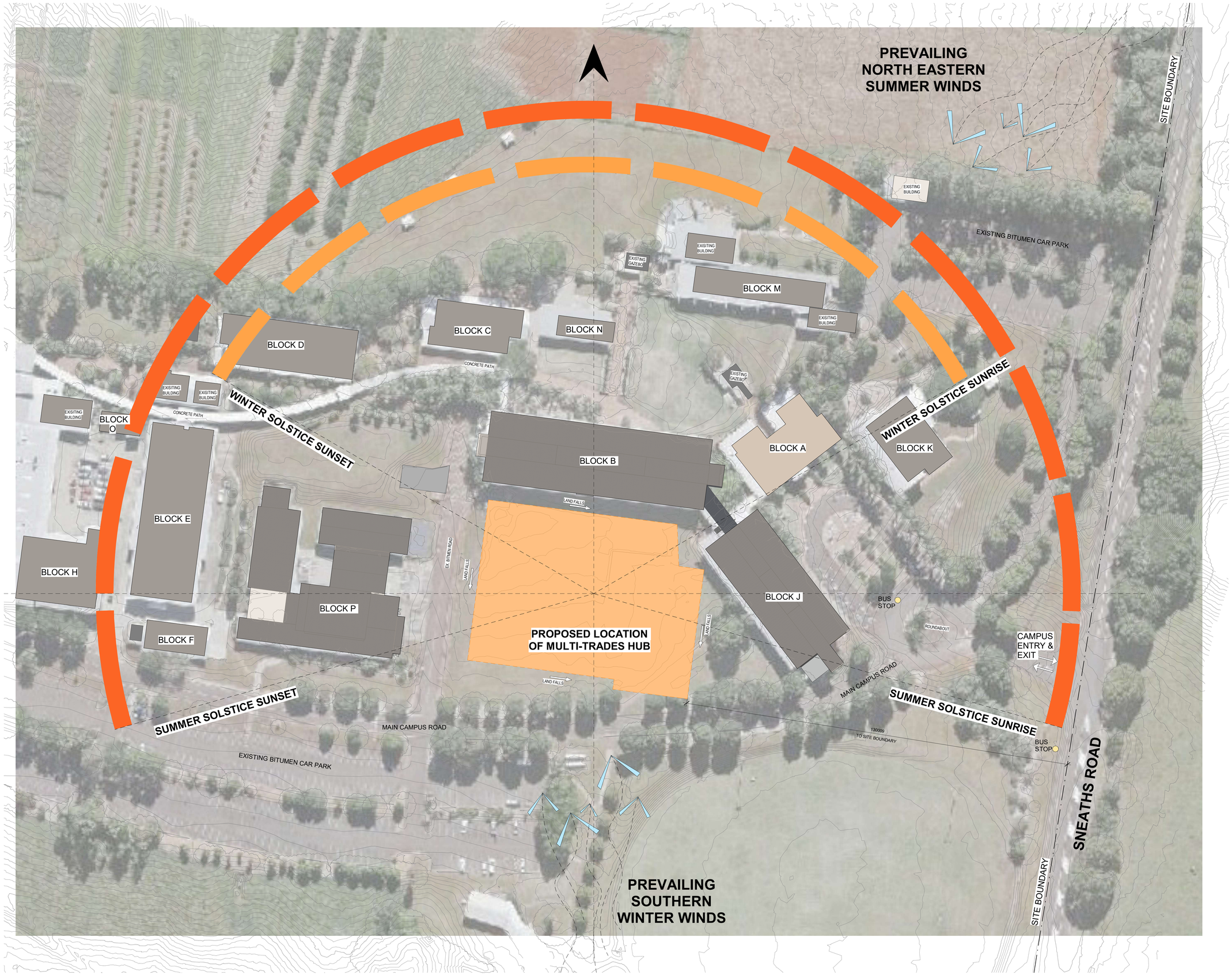
DATE : OCT 2024

PHASE : SD

DRAWING No : A-015

REV : E

EJE



ACN 002 912 843 I **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 I **F** +61 2 4926 3069
E mail@eje.com.au I **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	15-10-2024	PRE-DIA ISSUE	CdV/SG	TH	
B	12-12-2024	SCHEMATIC DESIGN ISSUE	CdV	TH	
C	20-12-2024	SCHEMATIC DESIGN ISSUE	CdV	TH	
D	15-01-2025	ISSUED FOR DA	CdV	TH	
E	30-01-2025	ISSUE FOR COORDINATION	CdV	TH	
F	25-02-2025	REVISED ISSUE FOR DA	CdV	TH	

0 20mm 100mm 200mm ON ORIGINAL B1

N

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

SITE ANALYSIS PLAN

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN : CdV

PROJECT No : 15223

SCALE : 1 : 500 @ B1

DATE : OCT 2024

PHASE : SD

DRAWING No : A-021

REV : F

EJE

Material Finishes Selection

The Multi-Trades Hub (MTH) features a carefully balanced palette of **charcoal, light grey, and yellow**, combining functionality with aesthetic appeal.

Charcoal
Charcoal tones are used in **window and door frames**, **exterior door leafs**, **fibre cement sheeting (Equitone Natura Pro finish)**, and select areas of **Colorbond wall sheeting in Monument**. These elements help minimize visual emphasis and reduce the building's scale, while the textured finish of the Equitone panels adds depth and visual interest.

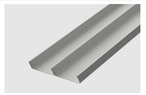
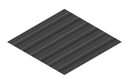
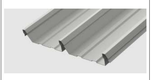
Light Grey
Colorbond Shale Grey provides a neutral, calming tone, reflecting natural elements like silvered tree bark and granite. This coloUr balances the building's scale, avoiding the starkness of white or the heaviness of black.

Yellow
Yellow accents bring vibrancy, highlight **key entry points**, and aid in **wayfinding**. Main entries on the northern and southern facades feature **Equitone Pictura Fibre Cement Cladding** in yellow. Additionally, the **northern steel awning**, finished in Dulux "Sunshine" yellow, offers shade and adds personality to the building.

Campus Connection
The yellow accents echo existing campus features, such as the window sills of Blocks J and B, creating a cohesive link between the MTH and its surroundings.

Balanced Materiality
The interplay of **charcoal, light grey, and yellow** achieves a harmonious blend of subtlety and vibrancy, enhancing the building's functionality and visual identity.

DA Finishes

ID Code	Image	Supplier	Item/ Description	Model/ Finish
M.FC1		Etex Group Mark Zangari 0421 879 383	Fibre Cement Cladding	Equitone Natura Pro 'NU074' Thickness: 8mm Fixing: Conceal Fixed
M.FC2		Etex Group Mark Zangari 0421 879 383	Fibre Cement Cladding	Equitone Pictura 'PG742 Thickness: 8mm Fixing: Conceal Fixed
M.MS1		Lysaght	Metal Wall Sheeting	Profile: Longline Finish: Colorbond 'Shale Grey'
M.MS2		Lysaght	Metal Wall Sheeting	Profile: Longline Finish: Colorbond 'Monument'
M.MS3		Lysaght	Metal Roof Sheeting	Profile: KLIP-LOK 700 Hi Strength Finish: Colorbond 'Shale Grey' Solar Absorptance: 0.44
M.PC1		Interpon Tim Mungovan 0414 161 044	Powdercoat	Range: DURATEC Zeus Colour: Monument Code: 90Z7307S
M.PC2		Dulux Jess Lindsay 0434 864 114	PowderCoat	Dulux - Duratec - Intensity Sunshine - 90N2084G

ACN 002 912 843 | **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 | **F** +61 2 4926 3069
E mail@eje.com.au | **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	12-12-2024	PRELIMINARY DA ISSUE	CdV	TH	
B	20-12-2024	SCHEDULE DESIGN ISSUE	CdV	TH	
C	15-01-2025	ISSUE FOR DA	CdV	TH	
D	30-01-2025	ISSUE FOR COORDINATION	CdV	TH	
E	25-02-2025	REVISED ISSUE FOR DA	CdV	TH	

200mm ON ORIGINAL @1

150mm

20mm

0

CLIENT :
TAFE NSW

TSA Riley

DRAWING :
MATERIALS AND FINISHES SCHEDULE

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :
Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN :	PROJECT No :
CdV	15223

SCALE :	DATE :
@ B1	DEC 2024

PHASE :	DRAWING No :	REV :
SD	A-030	E

EJE

ACN 002 912 843 | **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 | **F** +61 2 4926 3069
E mail@eje.com.au | **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	28-05-2024	ISSUED FOR REVIEW	CdV	TH	TH
B	27-06-2024	ISSUE FOR INITIAL COSTING	CdV	TH	TH
C	05-08-2024	ISSUE FOR COORDINATION	CdV	TH	TH
D	09-09-2024	PRELIMINARY CONCEPT DESIGN ISSUE	CdV	TH	TH
E	26-09-2024	CONCEPT DESIGN ISSUE	CdV	TH	TH
F	15-10-2024	ISSUE FOR COSTING	CdV	TH	TH
G	22-11-2024	ISSUE FOR COORDINATION	CdV/SRSG	TH	TH
H	12-12-2024	PRELIMINARY DA ISSUE	CdV	TH	TH
J	20-12-2024	SCHEMATIC DESIGN ISSUE	CdV	TH	TH
K	15-01-2025	ISSUE FOR COORDINATION	CdV	TH	TH
L	30-01-2025	ISSUE FOR COORDINATION	CdV	TH	TH
M	05-02-2025	REVISED ISSUE FOR DA	CdV	TH	TH
N					

AREA SCHEDULE	
TOTAL G.F.A.	**3883m²**

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

GENERAL ARRANGEMENT FLOOR PLAN

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

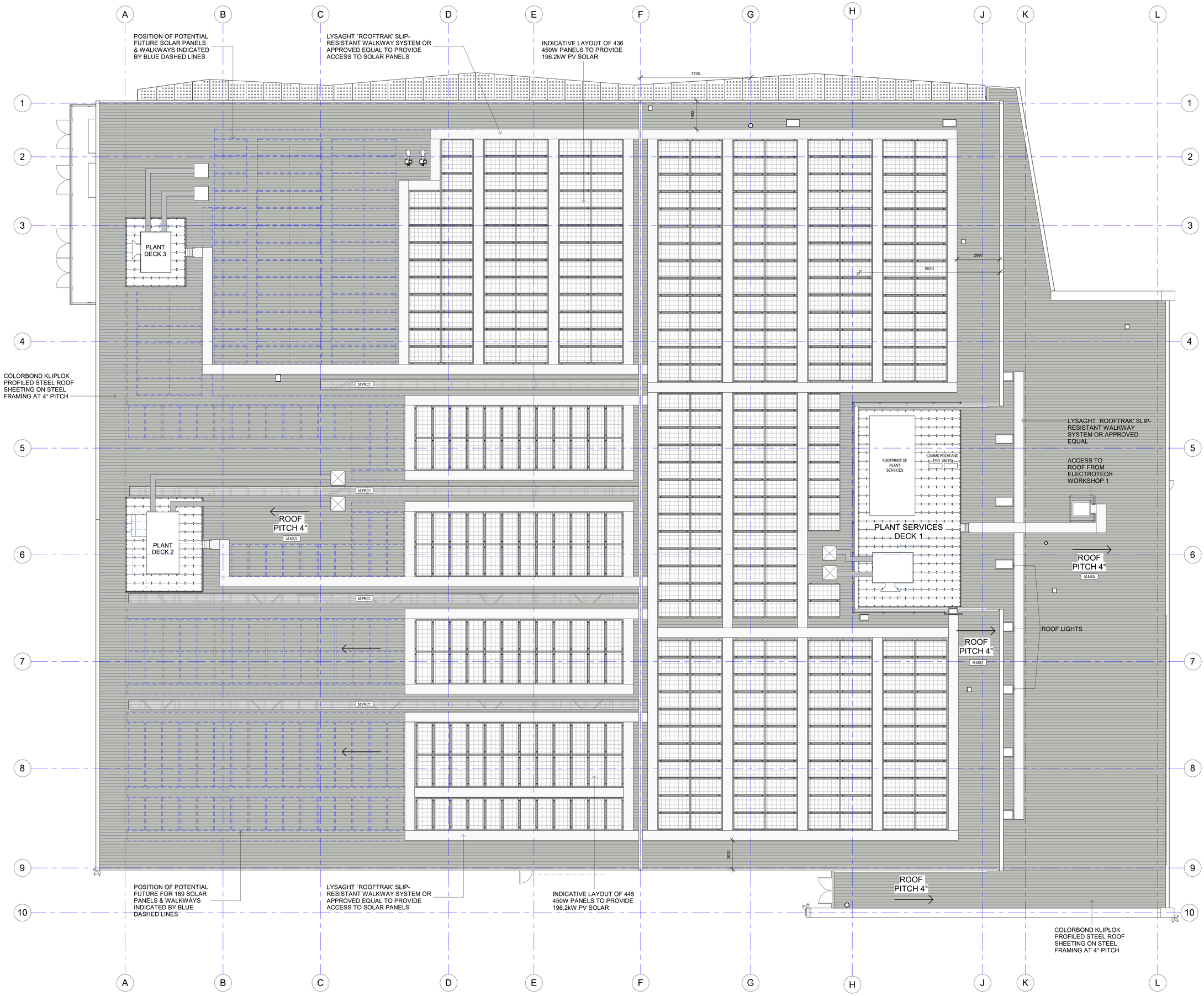
PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN :	PROJECT No :
CdV	15223
SCALE :	DATE :
1 : 100 @ B1	MAY 2024

PHASE :	DRAWING No :	REV :
SD	A-100	N

EJE



ACN 002 912 843 | **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 | **F** +61 2 4926 3069
E mail@eje.com.au | **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	28-05-2024	ISSUED FOR REVIEW	CdV	TH	
B	27-06-2024	ISSUE FOR INITIAL COSTING	CdV	TH	
C	09-08-2024	ISSUE FOR COORDINATION	CdV	TH	
D	15-10-2024	PRE-DA ISSUE	CdV/SG	TH	
E	22-11-2024	ISSUE FOR COORDINATION	SR/SG	TH	
F	12-12-2024	PRELIMINARY DA ISSUE	CdV	TH	
G	20-12-2024	ISSUE FOR COORDINATION	CdV	TH	
H	15-01-2025	ISSUED FOR DA	CdV	TH	
J	30-01-2025	ISSUE FOR COORDINATION	CdV	TH	
K	25-02-2025	REVISED ISSUE FOR DA	CdV	TH	

200mm ON ORIGINAL B1
100mm
50mm
0

N

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

ROOF PLAN

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN : CdV

PROJECT No : 15223

SCALE : 1 : 100 @ B1

DATE : MAY 2024

PHASE : SD

DRAWING No : A-105

REV : K

EJE

ACN 002 912 843 | **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 | **F** +61 2 4926 3069
E mail@eje.com.au | **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS
A	22-11-2024	ISSUE FOR COORDINATION
B	12-12-2024	PRELIMINARY ISSUE
C	16-12-2024	ISSUE FOR COORDINATION
D	18-12-2024	REVISED ISSUE FOR COORDINATION
E	20-12-2024	SCHEMATIC DESIGN ISSUE
F	15-01-2025	ISSUED FOR DA
G	25-02-2025	REVISED ISSUE FOR DA

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

REFERENCE PLAN OVERALL

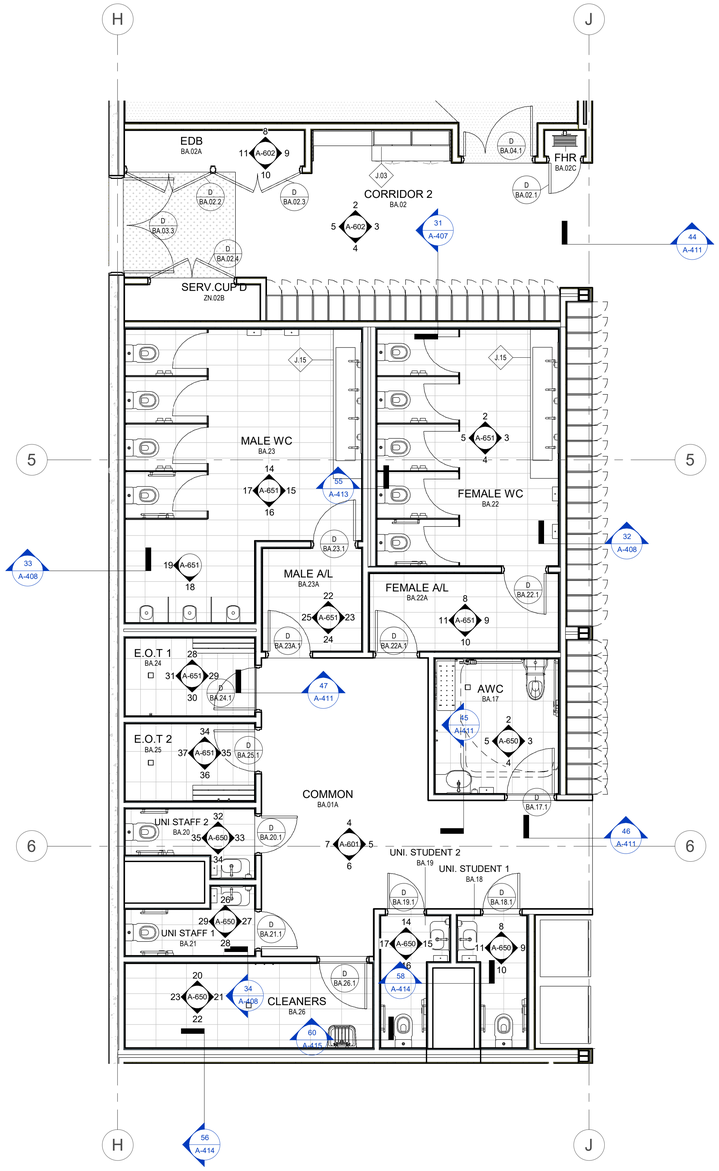
Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN :	PROJECT No :
CdV	15223
SCALE :	DATE :
1 : 100 @ B1	OCT 2024
PHASE :	DRAWING No :	REV :
SD	A-110	G

EJE



1 REFERENCE PLAN - AMENITIES & CORRIDOR 2

1 : 50

ACN 002 912 843 I **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 I **F** +61 2 4926 3069
E mail@eje.com.au I **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS
A	22-11-2024	ISSUE FOR COORDINATION
B	12-12-2024	REVISED ISSUE FOR DA
C	20-12-2024	SCHEMATIC DESIGN ISSUE
D	15-01-2025	ISSUED FOR DA
E	30-01-2025	ISSUE FOR COORDINATION
F	25-02-2025	REVISED ISSUE FOR DA

VRFD							
CHKD	TH	TH	TH	TH	TH	TH	TH
DRN	SR/SG	CdV	CdV	CdV	CdV	CdV	CdV

200mm ON ORIGINAL B1
100mm
20mm
0

CLIENT :

TAFE NSW

DRAWING :

REFERENCE PLAN AMENITIES & CORRIDOR 2

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
Bundjalung Country Wollongbar, NSW

BUNDJALUNG COUNTRY

DRAWN :	PROJECT No :
CdV	15223

SCALE :	DATE :
1 : 50 @ B1	OCT 2024

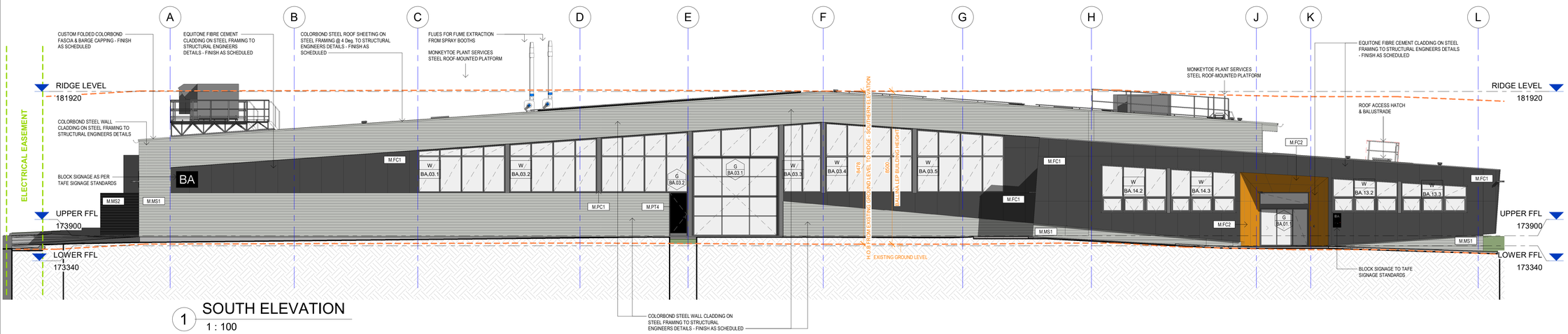
PHASE :	DRAWING No :	REV :
SD	A-111	F

ACN 002 912 843 I **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 I **F** +61 2 4926 3069
E mail@eje.com.au I **W** www.eje.com.au

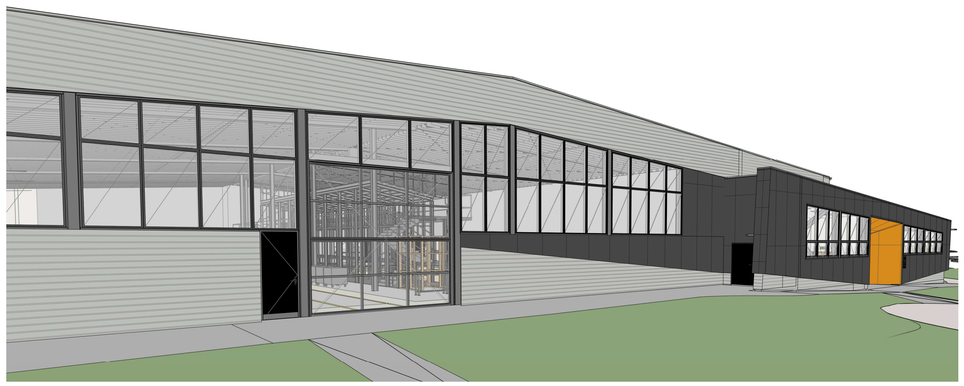
COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

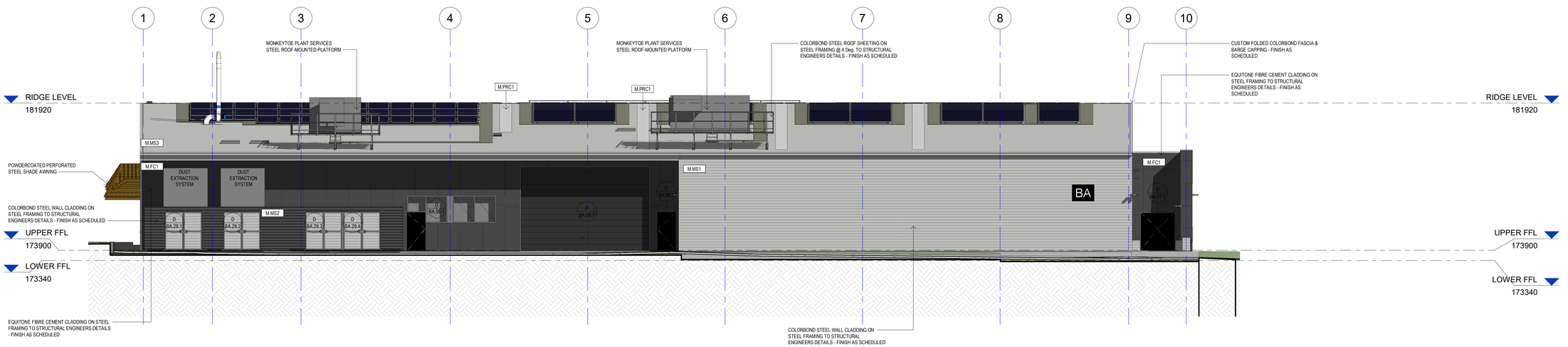
THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.



1 SOUTH ELEVATION
1 : 100





2 WEST ELEVATION
1 : 100

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	28-05-2024	ISSUED FOR REVIEW	CdV	TH	TH
B	02-07-2024	ISSUE FOR COORDINATION	CdV	TH	TH
C	15-10-2024	PRELIMINARY DA ISSUE	CdV/CS	TH	TH
D	22-11-2024	ISSUE FOR COORDINATION	SR/SG	TH	TH
E	12-12-2024	PRELIMINARY DA ISSUE	CdV	TH	TH
F	16-12-2024	ISSUE FOR COORDINATION	CdV	TH	TH
G	20-12-2024	SCHEMATIC DESIGN ISSUE	CdV	TH	TH
H	15-01-2025	ISSUED FOR DA	CdV	TH	TH
J	30-01-2025	ISSUE FOR COORDINATION	CdV	TH	TH
K	25-02-2025	REVISED ISSUE FOR DA	CdV	TH	TH

200mm ON ORIGINAL B1
150mm
50mm
0

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

ELEVATIONS - SOUTH & WEST

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN :	PROJECT No :
CdV	15223
SCALE :	**DATE :**
1 : 100 @ B1	JUNE 2024
PHASE :	**DRAWING No :**	**REV :**
SD	A-200	K

EJE

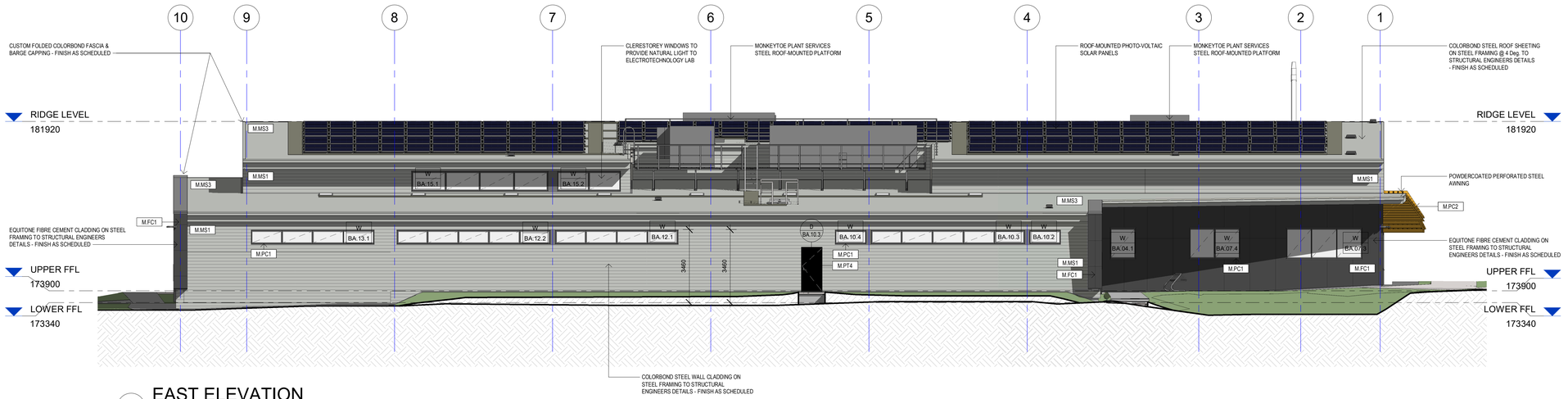
ACN 002 912 843 I **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 I **F** +61 2 4926 3069
E mail@eje.com.au I **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

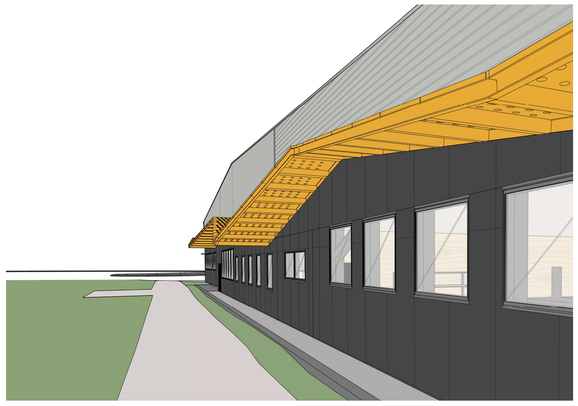
THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

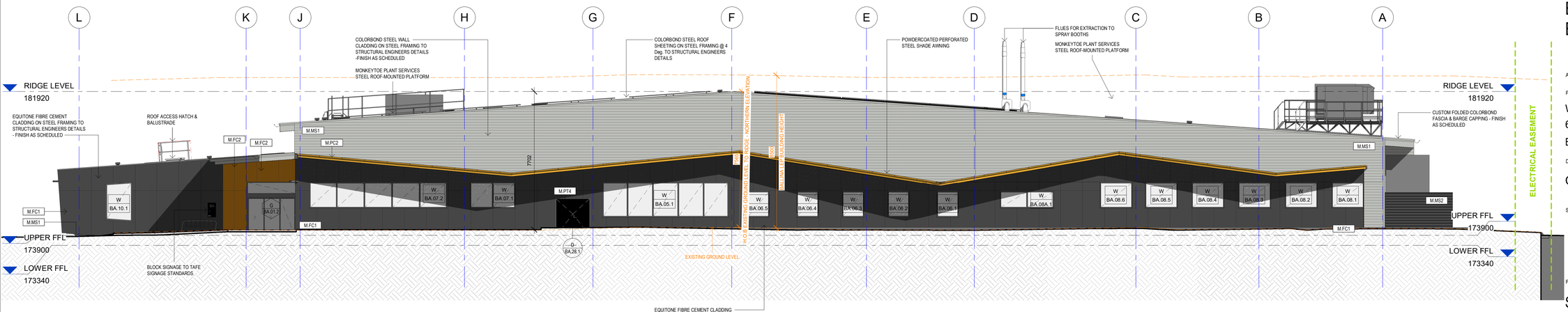
WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	28-05-2024	ISSUED FOR REVIEW	CdV	TH	TH
B	02-07-2024	ISSUE FOR COORDINATION	CdV	TH	TH
C	15-10-2024	PRELIMINARY DA ISSUE	CdV/SS	TH	TH
D	22-11-2024	ISSUE FOR COORDINATION	SR/SG	TH	TH
E	12-12-2024	PRELIMINARY DA ISSUE	CdV	TH	TH
F	16-12-2024	ISSUE FOR COORDINATION	CdV	TH	TH
G	20-12-2024	SCHEMATIC DESIGN ISSUE	CdV	TH	TH
H	15-01-2025	ISSUED FOR DA	CdV	TH	TH
J	30-01-2025	ISSUE FOR COORDINATION	CdV	TH	TH
K	25-02-2025	REVISED ISSUE FOR DA	CdV	TH	TH



1 EAST ELEVATION
1 : 100





2 NORTH ELEVATION
1 : 100

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

ELEVATIONS - NORTH & EAST

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN :	PROJECT No :
CdV	15223
SCALE :	DATE :
1 : 100 @ B1	JUNE 2024

PHASE :	DRAWING No :	REV :
SD	A-201	K

EJE

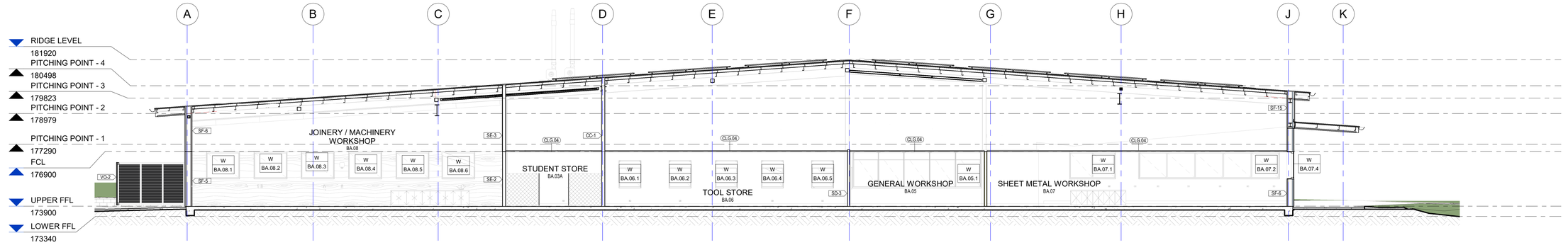
200mm ON ORIGINAL B1
150mm
0
20mm

ACN 002 912 843 | **ABN** 82 644 649 849
Nominated Architect - Barnard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 | **F** +61 2 4926 3069
E mail@eje.com.au | **W** www.eje.com.au

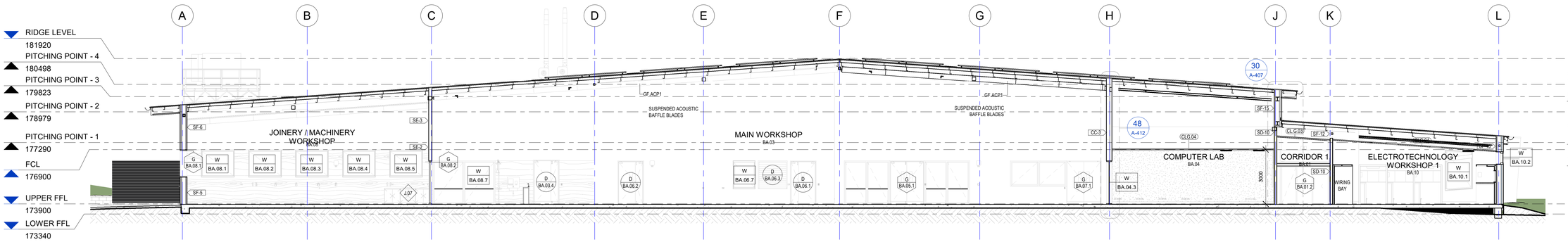
COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

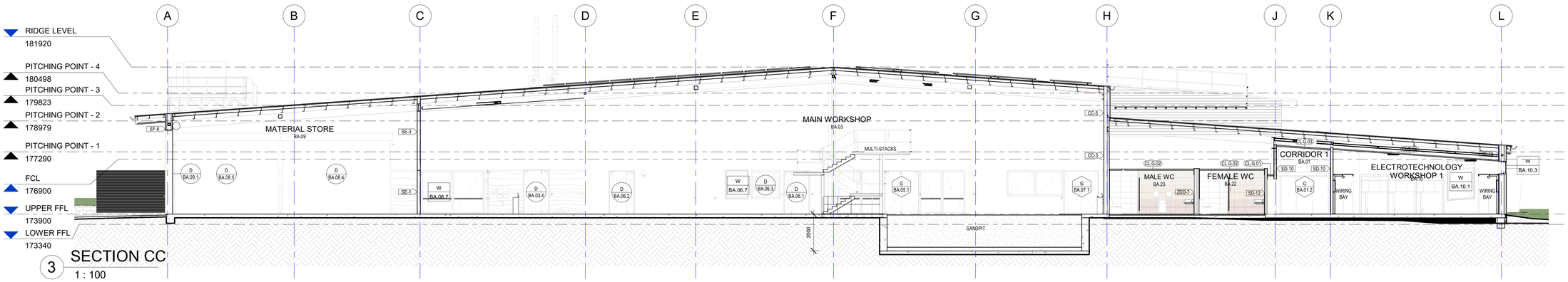
WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.



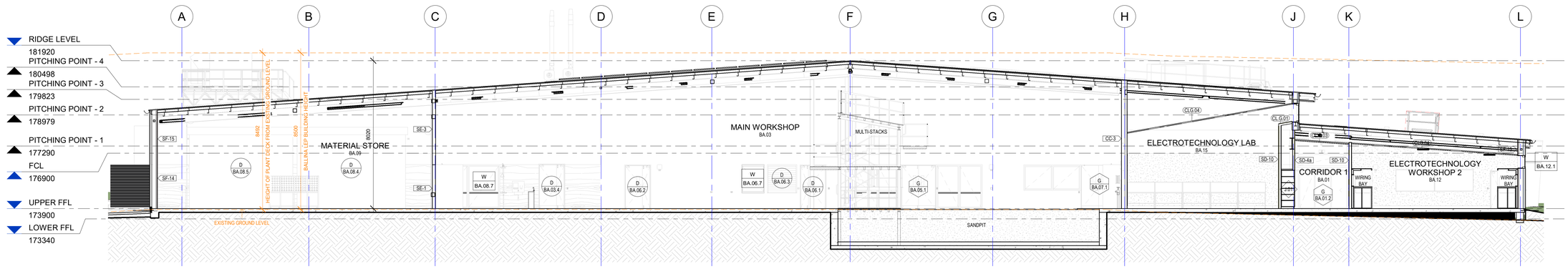
1 SECTION AA
1 : 100



2 SECTION BB
1 : 100



3 SECTION CC
1 : 100



4 SECTION DD
1 : 100

REV	DATE	COMMENTS
A	28-05-2024	ISSUED FOR REVIEW
B	27-06-2024	ISSUE FOR INITIAL COSTING
C	08-08-2024	ISSUE FOR COORDINATION
D	15-10-2024	PRE-DA ISSUE
E	22-11-2024	ISSUE FOR COORDINATION
F	12-12-2024	PRELIMINARY DA ISSUE
G	13-12-2024	ISSUE FOR COORDINATION
H	20-12-2024	SCHEMATIC DESIGN ISSUE
J	15-01-2025	ISSUED FOR DA
K	30-01-2025	ISSUE FOR COORDINATION
L	25-02-2025	REVISED ISSUE FOR DA

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

SECTIONS AA, BB, CC & DD

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

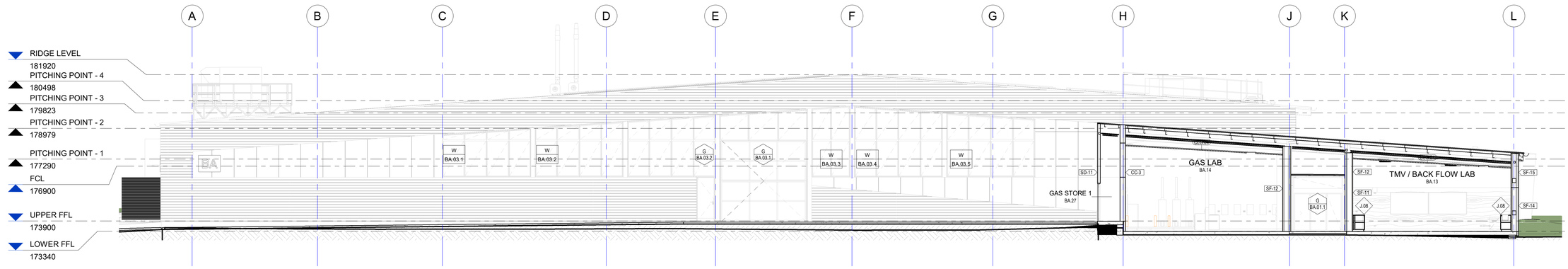
Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN :	PROJECT No :
SG	15223

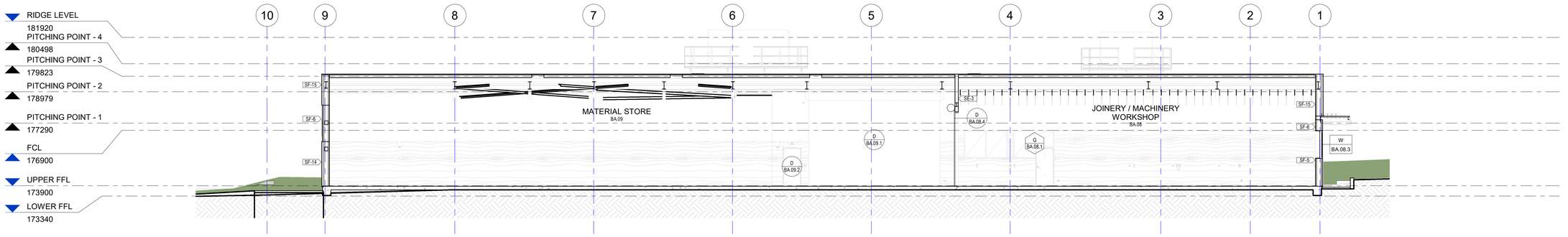
SCALE :	DATE :
1 : 100 @ B1	JULY 2024

PHASE :	DRAWING No :	REV :
SD	A-300	L

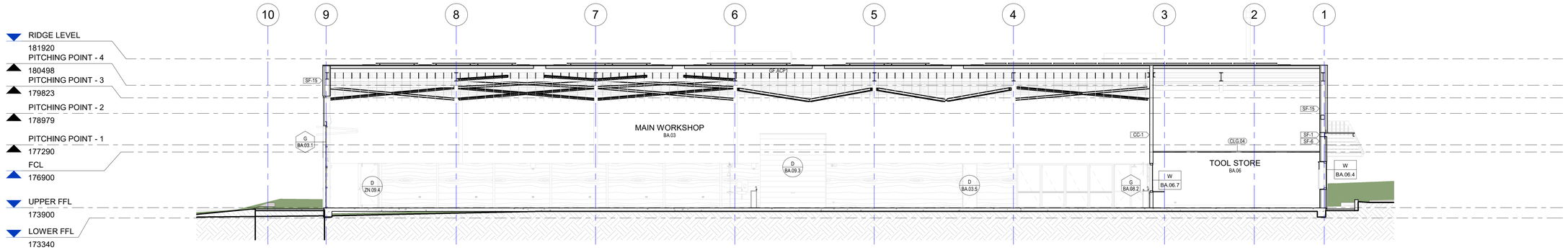
EJE



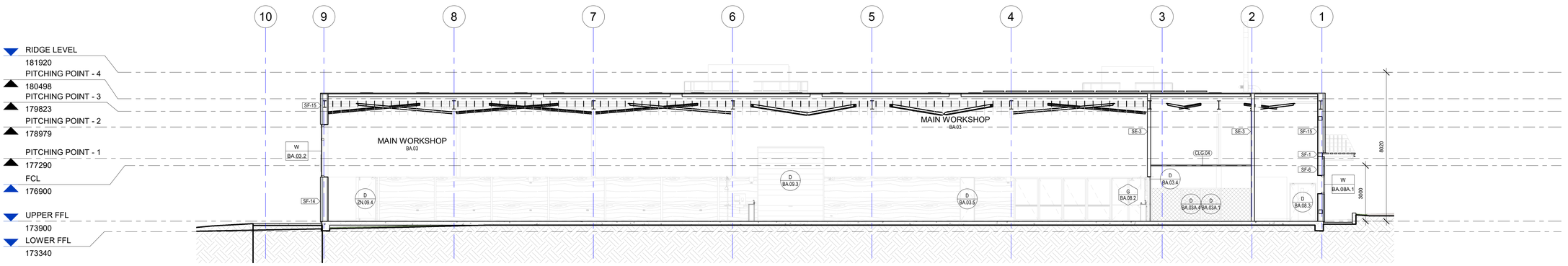
2 SECTION EE
1 : 100



1 SECTION FF
1 : 100



3 SECTION GG
1 : 100



4 SECTION HH
1 : 100

ACN 002 912 843 I **ABN** 82 644 649 849
Nominated Architect - Barnard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 I **F** +61 2 4926 3069
E mail@eje.com.au I **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS
A	28-05-2024	ISSUED FOR REVIEW
B	27-06-2024	ISSUE FOR INITIAL COSTING
C	08-10-2024	ISSUE FOR COORDINATION
D	15-10-2024	PRE-DA ISSUE
E	22-11-2024	ISSUE FOR COORDINATION
F	12-12-2024	PRELIMINARY DA ISSUE
G	19-12-2024	ISSUE FOR COORDINATION
H	20-12-2024	SCHEMATIC DESIGN ISSUE
J	15-01-2025	ISSUED FOR DA
K	30-01-2025	ISSUE FOR COORDINATION
L	25-02-2025	REVISED ISSUE FOR DA

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

SECTIONS EE, FF, GG & HH

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

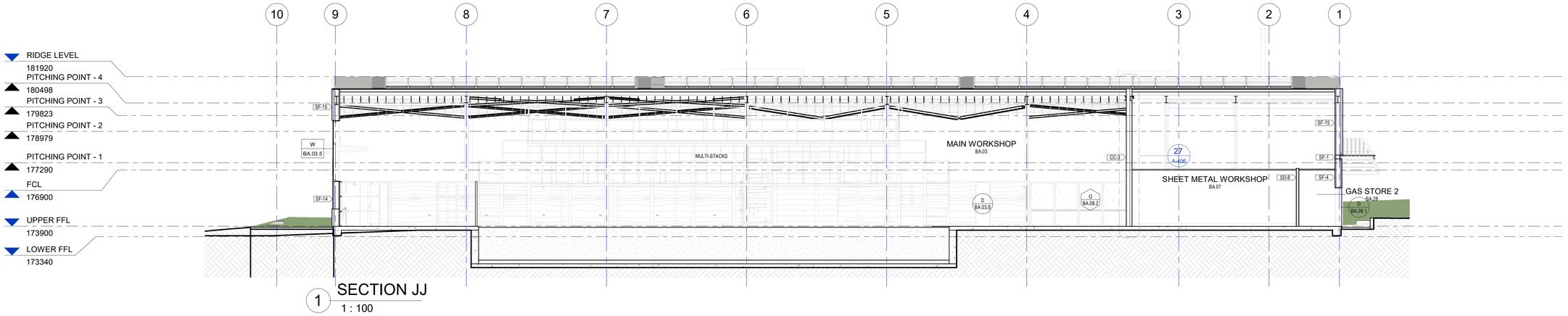
DRAWN :	PROJECT No :
SG	15223

SCALE :	DATE :
1 : 100 @ B1	JULY 2024

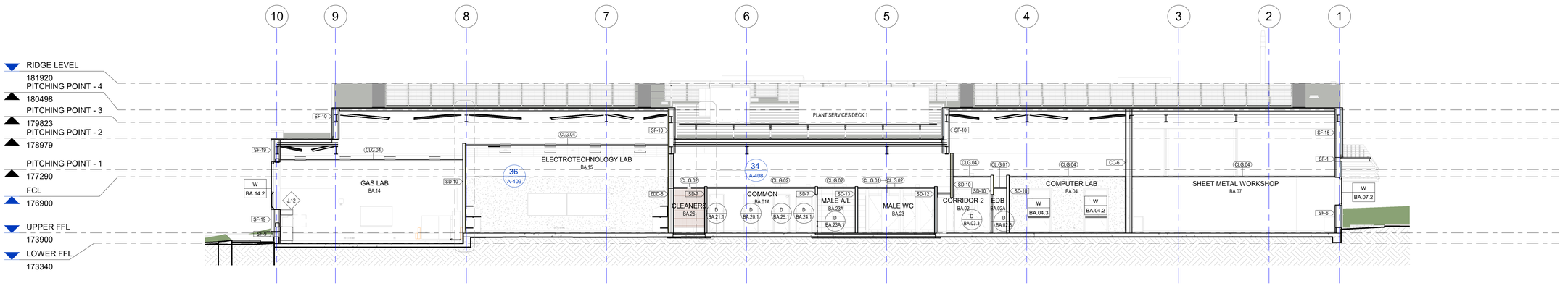
PHASE :	DRAWING No :	REV :
SD	A-301	L

EJE

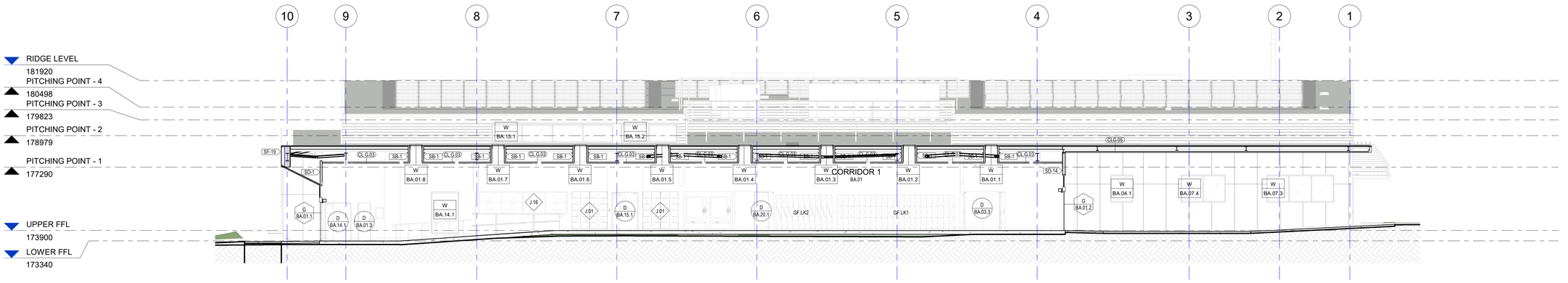
200mm ON ORIGINAL B1
100mm
50mm
0



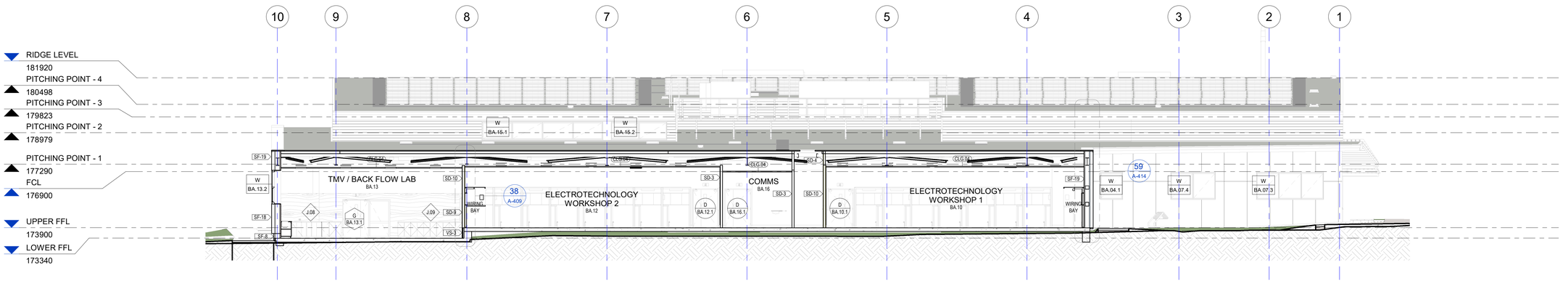
1 SECTION JJ
1 : 100



2 SECTION KK
1 : 100



3 SECTION LL
1 : 100



4 SECTION MM
1 : 100

ACN 002 912 843 I **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 I **F** +61 2 4926 3069
E mail@eje.com.au I **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	28-06-2024	ISSUED FOR REVIEW	CdV	TH	
B	27-08-2024	ISSUE FOR INITIAL COSTING	CdV	TH	
C	06-09-2024	ISSUE FOR COORDINATION	CdV	TH	
D	15-10-2024	PRE-DA ISSUE	CdV/SG	TH	
E	22-11-2024	ISSUE FOR COORDINATION	SR/SG	TH	
F	12-12-2024	PRELIMINARY DA ISSUE	CdV	TH	
G	19-12-2024	ISSUE FOR COORDINATION	CdV	TH	
H	20-12-2024	SCHEMATIC DESIGN ISSUE	CdV	TH	
J	15-01-2025	ISSUED FOR DA	CdV	TH	
K	30-01-2025	ISSUE FOR COORDINATION	CdV	TH	
L	25-02-2025	REVISED ISSUE FOR DA	CdV	TH	

200mm ON ORIGINAL B1
100mm
50mm
0

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

SECTIONS JJ, KK, LL & MM

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
BUNDJALUNG COUNTRY

DRAWN :	PROJECT No :
SG	15223

SCALE :	DATE :
1 : 100 @ B1	JULY 2024

PHASE :	DRAWING No :	REV :
SD	A-302	L

EJE

PROPOSED TAFE MULTI-TRADES HUB
61 SNEATHS ROAD, WOLLONGBAR NSW 2477

LOCALITY PLAN
SOURCE: SIXMAPS - 11.12.2024
NOT TO SCALE

DRAWING SCHEDULE	
DRAWING NO.	DRAWING NAME
CE000	COVER SHEET
CE100	GENERAL ARRANGEMENT PLAN
CE110	STORMWATER MANAGEMENT PLAN
CE150	MUSIC CATCHMENT PLAN
CE200	CIVIL DRAINAGE DETAILS - SHEET 1
CE201	CIVIL DRAINAGE DETAILS - SHEET 2
CE300	SEDIMENT AND EROSION CONTROL PLAN
CE305	SEDIMENT AND EROSION CONTROL DETAILS

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

BEFORE YOU DIG www.byda.com.au

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

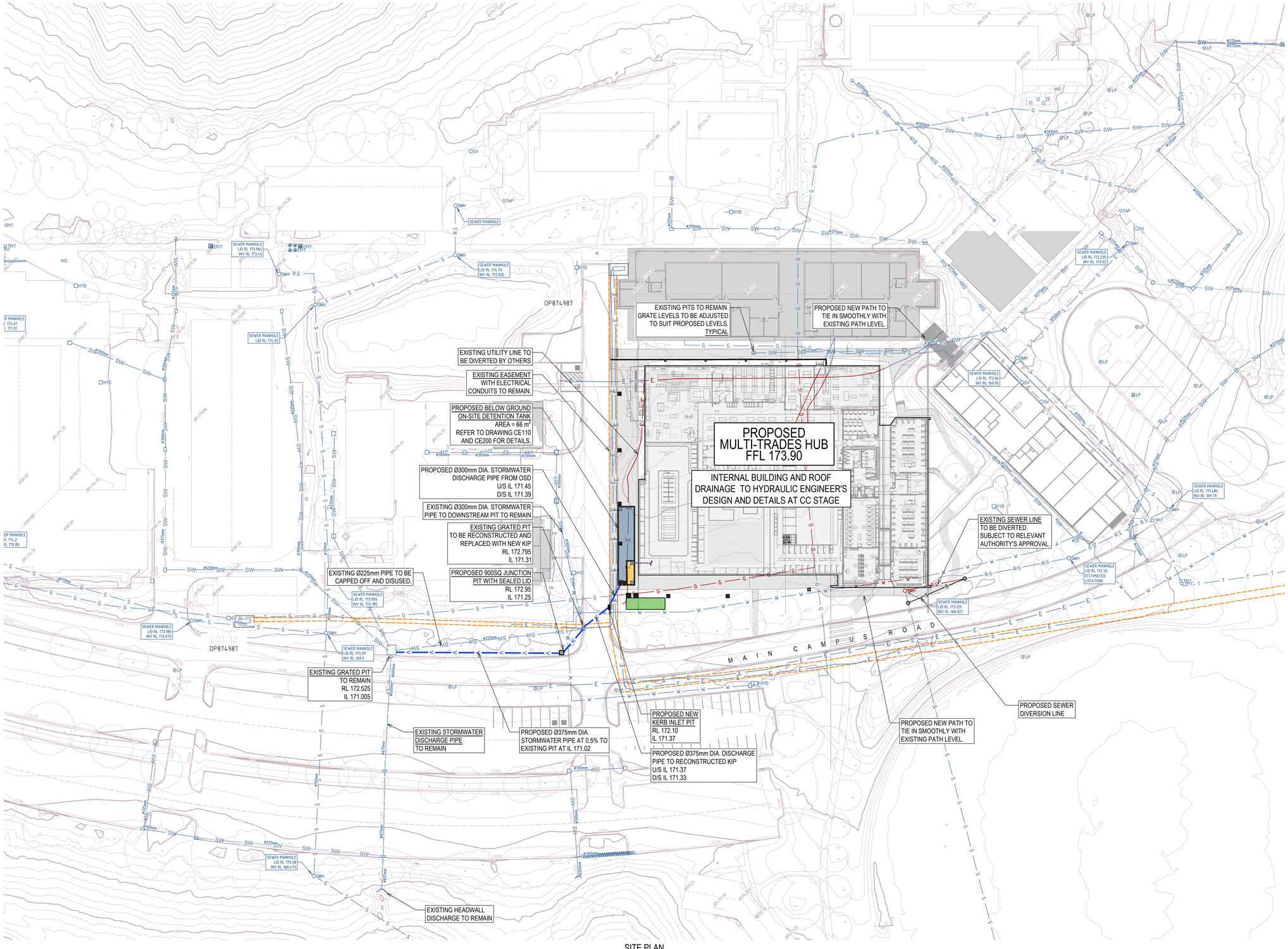
Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
COVER SHEET

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024		@ A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE000	B	



SITE PLAN
SCALE 1:500

LEGEND

- SITE BOUNDARY
- EASEMENT BOUNDARY AND EXTENT
- PROPOSED STORMWATER LINE
- PROPOSED DRAINAGE LINE (BY HYDRAULIC ENGINEER)
- SUBSOIL LINE
- PROPOSED GRATED DRAIN
- EXISTING STORMWATER LINE
- EXISTING ELECTRICAL LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING UTILITY LINE TO BE DIVERTED
- PROPOSED NEW UTILITY LINE
- BATTER LINE
- GRATED SURFACE INLET PIT
- SEALED JUNCTION PIT
- FINISHED RL

NOTES:
1. ALL STORMWATER PIPES ARE Ø100mm uPVC @1% MIN. GRADE UNLESS NOTED OTHERWISE.
2. ALL SUBSOIL PIPES ARE Ø100mm AG PIPE.
3. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE
4. BASEMENT SLAB MIN FALL 1% TOWARDS RWO, FW, PITS TO MEET REQUIREMENTS OF AS:2890.
5. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS,GTD, GPT, RWO AND PD ARE TO BE LIGHT DUTY OR CLASS B IN LANDSCAPE AREA U.N.O.
6. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS,GTD, GPT, RWO AND PD ARE TO BE HEAVY DUTY OR CLASS D IN DRIVEWAY AREA U.N.O.
7. SURVEY INFORMATION HAS BEEN OBTAINED FROM SURVEY PLAN PREPARED BY BARNSON PTY LTD TITLED 'PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987' - REF 40701-L01 DATED 06/04/2023 REV B.
8. EXISTING UTILIES INFORMATION HAS BEEN OBTAINED FROM SERVICE LOCATOR PLAN PREPARED BY BARNSON PTY LTD TITLED 'PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987' - REF 40701-L01 DATED 16/08/2024 REV C.

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

A1 0 5 10 15 20 25 30 35 40 45 50 1:500

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

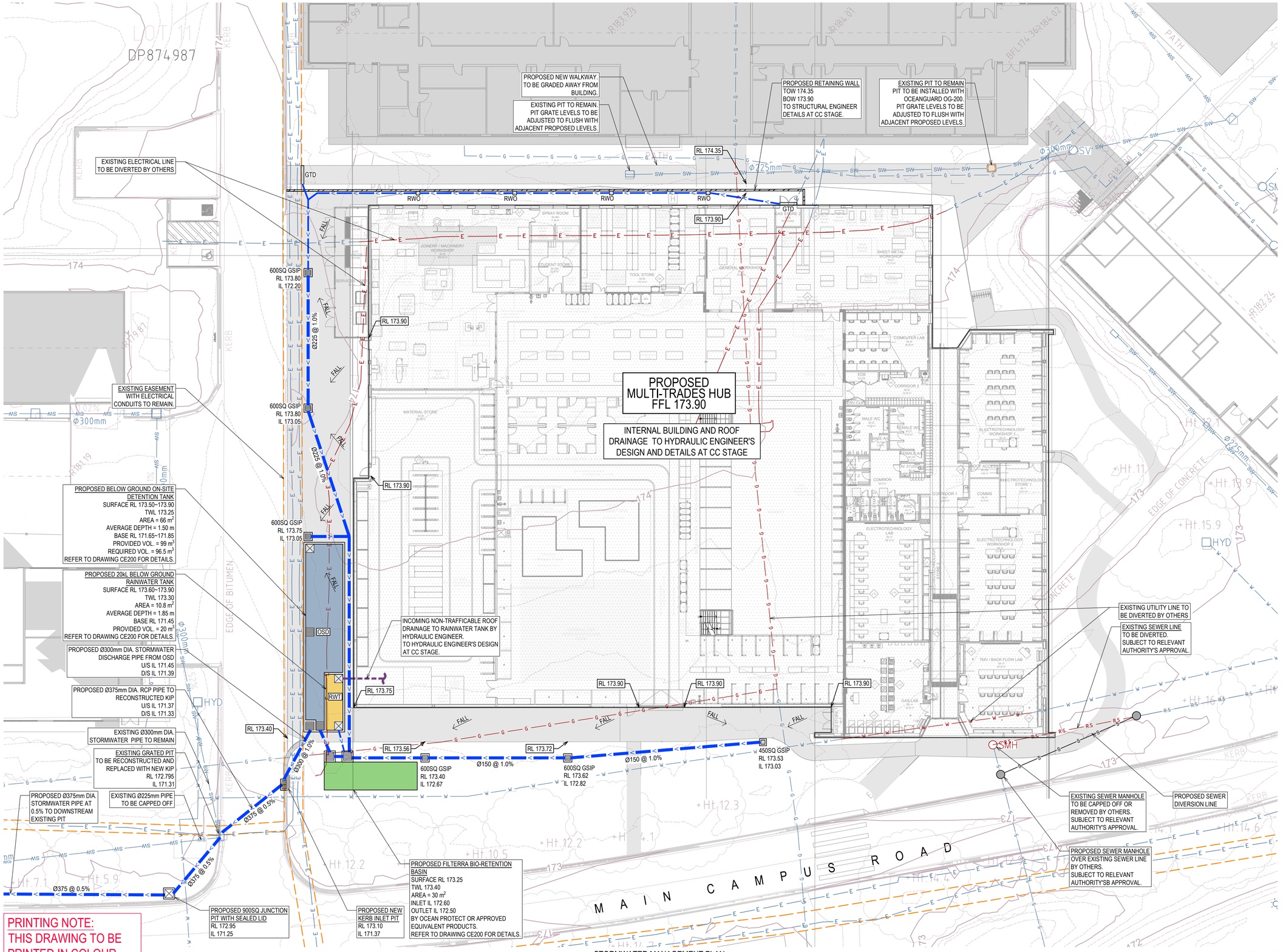
Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
GENERAL ARRANGEMENT PLAN

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024	1:500 @	A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE100	B	



LEGEND

- SITE BOUNDARY
- EASEMENT BOUNDARY AND EXTENT
- PROPOSED STORMWATER LINE
- PROPOSED DRAINAGE LINE (BY HYDRAULIC ENGINEER)
- SUBSOIL LINE
- PROPOSED GRATED DRAIN
- EXISTING STORMWATER LINE
- EXISTING ELECTRICAL LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING UTILITY LINE TO BE DIVERTED
- PROPOSED NEW UTILITY LINE
- BATTER LINE
- GRATED SURFACE INLET PIT
- SEALED JUNCTION PIT
- FINISHED RL

NOTES:

1. ALL STORMWATER PIPES ARE Ø100mm uPVC @1% MIN. GRADE UNLESS NOTED OTHERWISE.
2. ALL SUBSOIL PIPES ARE Ø100mm AG PIPE.
3. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE
4. BASEMENT SLAB MIN FALL 1% TOWARDS RWO, FW, PITS TO MEET REQUIREMENTS OF AS:2890.
5. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS,GTD, GPT, RWO AND PD ARE TO BE LIGHT DUTY OR CLASS B IN LANDSCAPE AREA U.N.O.
6. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS,GTD, GPT, RWO AND PD ARE TO BE HEAVY DUTY OR CLASS D IN DRIVEWAY AREA U.N.O.
7. SURVEY INFORMATION HAS BEEN OBTAINED FROM SURVEY PLAN PREPARED BY BARNSON PTY LTD TITLED 'PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987' - REF 40701-L01 DATED 06/04/2023 REV B.
8. EXISTING UTILIES INFORMATION HAS BEEN OBTAINED FROM SERVICE LOCATOR PLAN PREPARED BY BARNSON PTY LTD TITLED 'PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987' - REF 40701-L01 DATED 16/08/2024 REV C.

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

STORMWATER MANAGEMENT PLAN
SCALE 1:200

A1 0 2 4 6 8 10 12 14 16 18 20 1:200

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client: TAFE NSW

Architect: EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

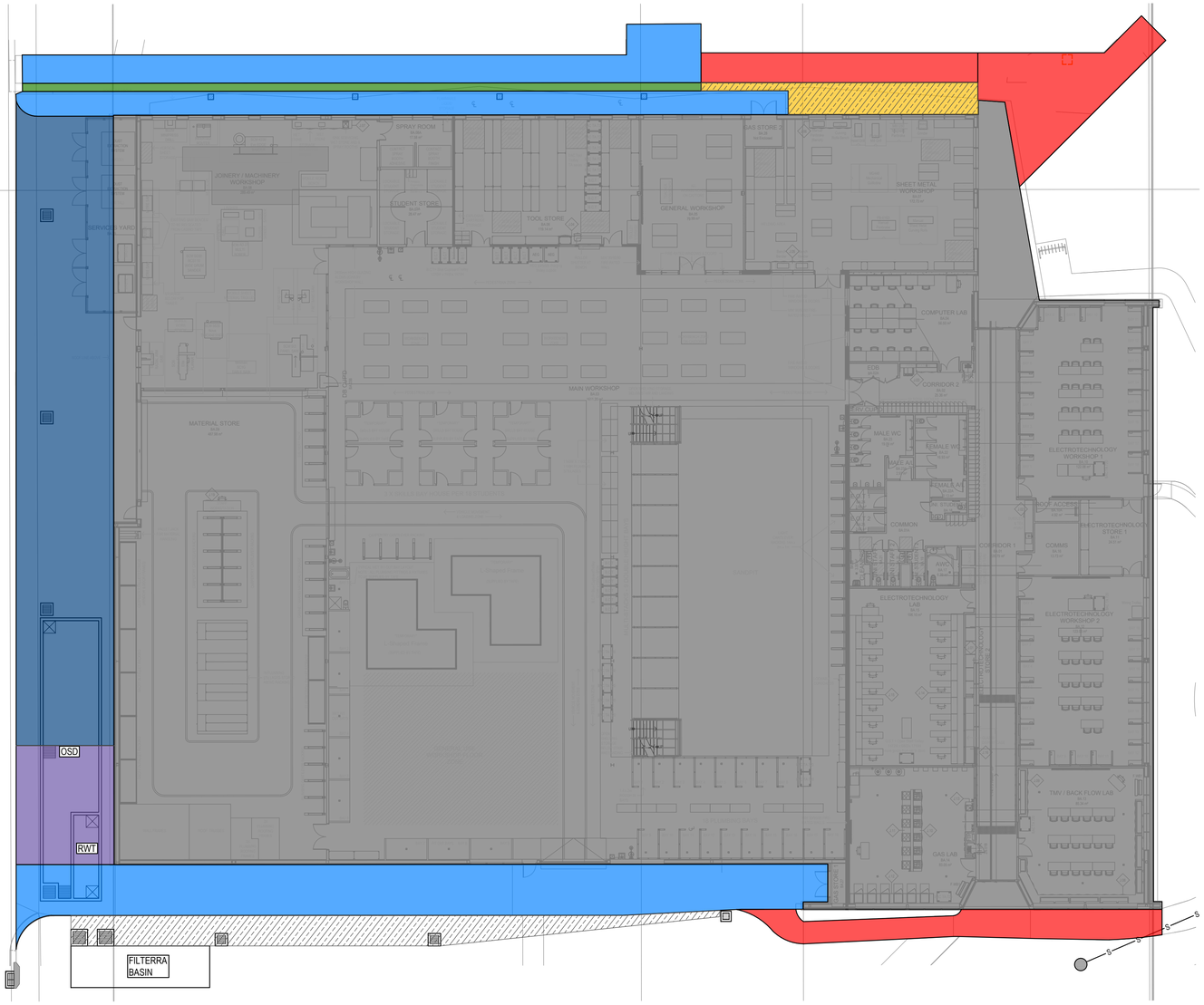
Building Services Consultants: ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project: TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

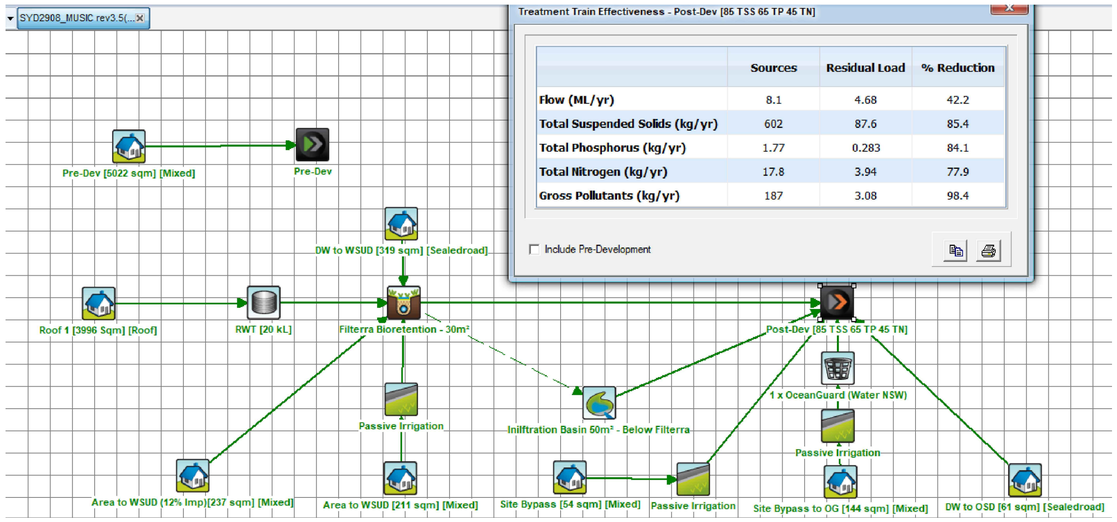
Drawing Title: CIVIL ENGINEERING SERVICES
STORMWATER MANAGEMENT PLAN

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024	1:200	@ A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE110	B	



MUSIC CATCHMENT PLAN
SCALE 1:200



Treatment Train Effectiveness - Post-Dev [85 TSS 65 TP 45 TN]

	Sources	Residual Load	% Reduction
Flow (ML/yr)	8.1	4.68	42.2
Total Suspended Solids (kg/yr)	602	87.6	85.4
Total Phosphorus (kg/yr)	1.77	0.283	84.1
Total Nitrogen (kg/yr)	17.8	3.94	77.9
Gross Pollutants (kg/yr)	187	3.08	98.4

Include Pre-Development

MUSIC TREATMENT TRAIN AND RESULT
NTS

TOTAL CATCHMENT AREA = 5,022 m²

	LANDSCAPE TO WSUD SYSTEM	= 29 m²
	IMPERVIOUS TO WSUD SYSTEM	= 419 m²
	ROOF AREA TO WSUD SYSTEM	= 3,996 m²
	DRIVEWAY TO WSUD SYSTEM	= 319 m²
	DRIVEWAY STRAIGHT TO OSD BYPASSING WSUD SYSTEM	= 61 m²
	IMPERVIOUS BYPASS	= 109 m²
	PERVIOUS BYPASS	= 35 m²
	PASSIVE IRRIGATION (LANDSCAPE)	

WATER QUALITY TARGET

IN ACCORDANCE WITH BALLINA COUNCIL'S DESIGN GUIDELINE 'STORMWATER MANAGEMENT STANDARDS FOR DEVELOPMENT', AT THE MINIMUM THE FOLLOWING POLLUTANT LOAD REDUCTION TARGETS WOULD NEED TO BE ACHIEVED:
- 60% TOTAL SUSPENDED SOLIDS
- 60% TOTAL PHOSPHORUS
- 45% TOTAL NITROGEN
- 90% GROSS POLLUTANTS

HOWEVER, IN ACCORDANCE WITH TAFE 'SUSTAINABLE DESIGN STANDARD' TO ACHIEVE TAFE'S SUSTAINABILITY TARGET THE FOLLOWING REDUCTION TARGETS WOULD NEED TO BE ACHIEVED:
- 40% REDUCTION IN STORMWATER DISCHARGE (ML/YR)
- 85% TOTAL SUSPENDED SOLIDS
- 65% TOTAL PHOSPHORUS
- 45% TOTAL NITROGEN
- 90% GROSS POLLUTANTS

THEREFORE, THE PROPOSED WATER QUALITY SYSTEM HAS BEEN DESIGNED TO ACHIEVE TAFE'S SUSTAINABILITY CRITERIA AS IT IS MORE CRITICAL OF THE TWO.

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

A1 0 2 4 6 8 10 12 14 16 18 20 1:200

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

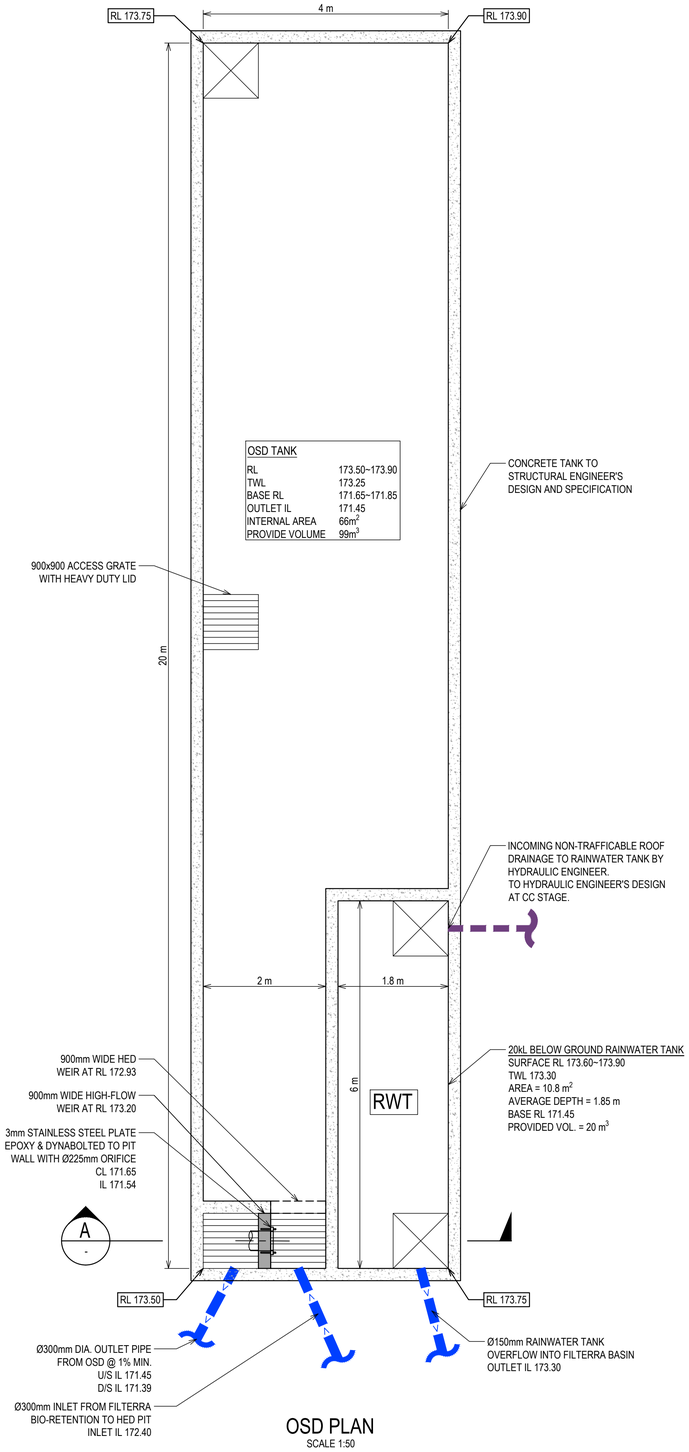
Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
MUSIC CATCHMENT PLAN

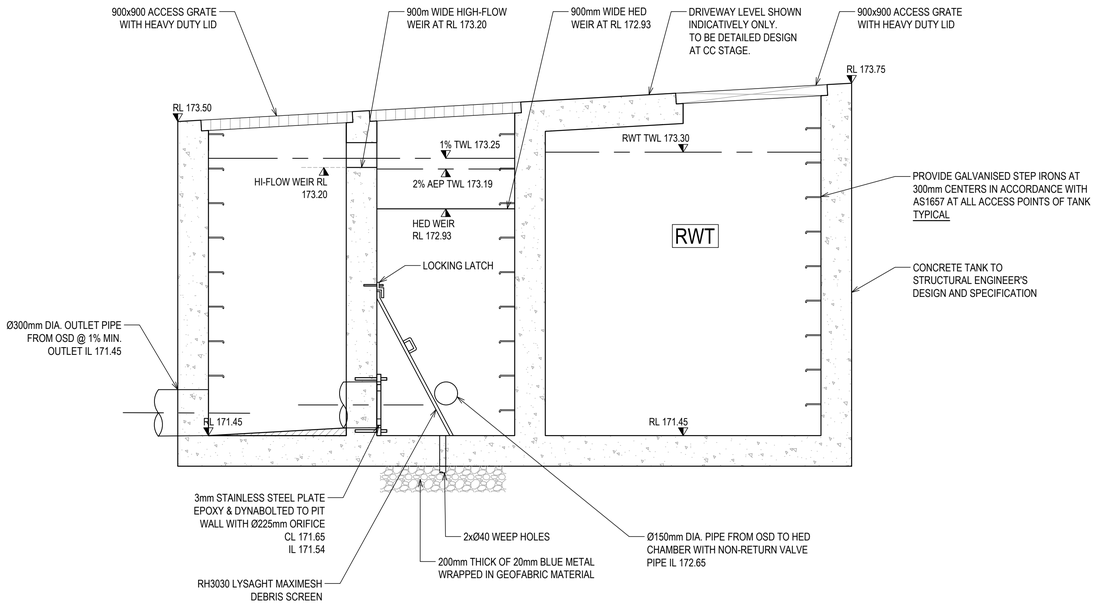
DEVELOPMENT APPLICATION

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024	1:200 @	A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE150	B	



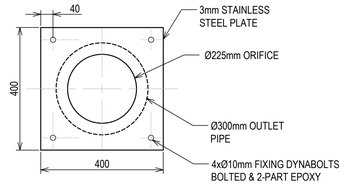
OSD PLAN
SCALE 1:50



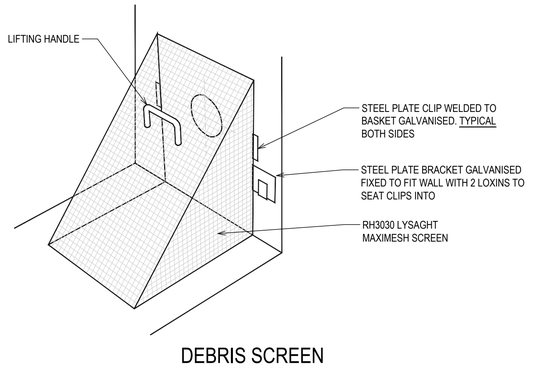
SECTION A
SCALE 1:20
OSD TANK

AEP STORM	PRE-DEV SITE DISCHARGE (L/s)	POST-DEV BYPASS (L/s)	POST-DEV CONTROLLED OSD DISCHARGE (L/s)	POST-DEV TOTAL PEAK SITE DISCHARGE (L/S)	REQUIRED OSD VOLUME (m^3)
10%	123	7	115	122	18.9
5%	147	8	116	124	27.0
2%	173	9	119	128	38.8
1%	192	10	133	143	96.5

DRAINS MODEL PRE-DEV POST-DEV SITE DISCHARGE COMPARISON



ORIFICE PLATE DETAIL
SCALE 1:10



DEBRIS SCREEN
NOT TO SCALE

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

A1 0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 1:50
A1 0 0.5 1.0 1.5 2.0 1:20
A1 0 0.25 0.50 0.75 1.00 1:10

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

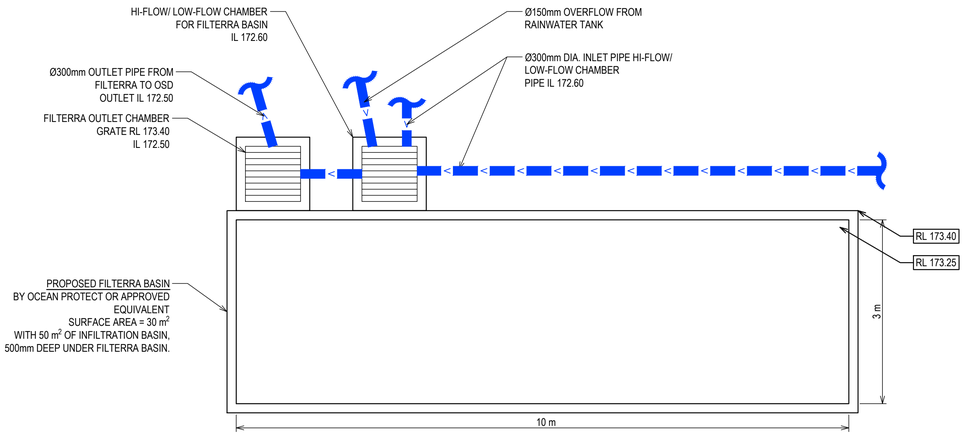
Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
CIVIL DRAINAGE DETAILS - SHEET 1

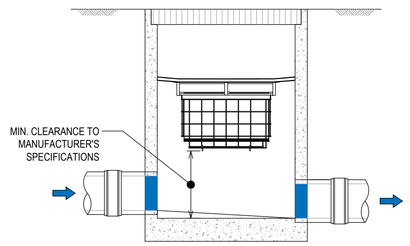
Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024		@ A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE200	B	

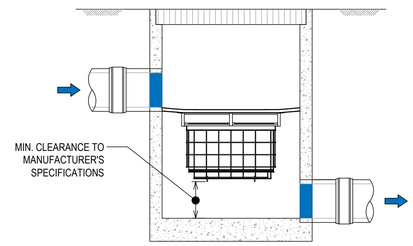


FILTERRA BASIN PLAN

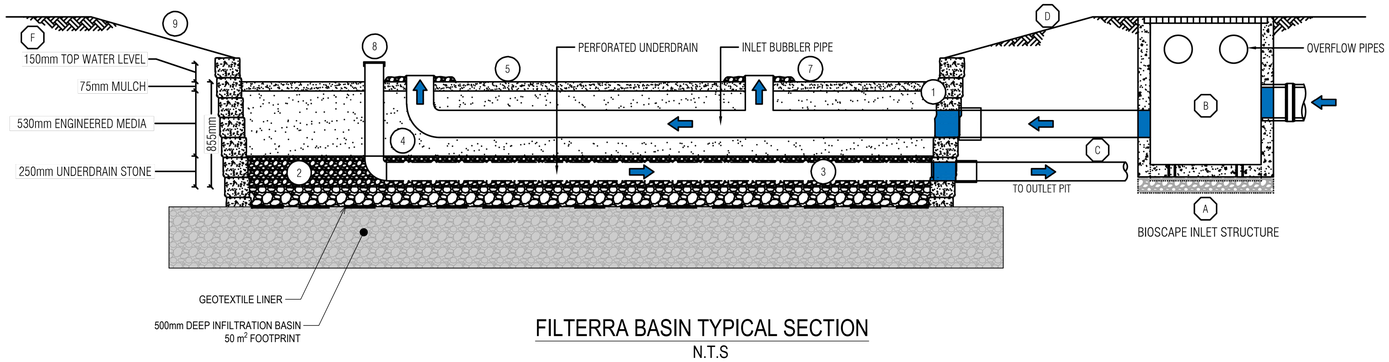
SCALE 1:50



PIT INSERT CONFIGURATION
GRATED SURFACE INLET PIT
SCALE 1:20

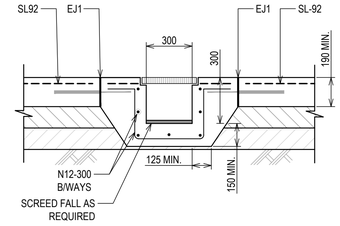


PIT INSERT CONFIGURATION
ROOFWATER INLET/END OF LINE
STORMWATER INLET PIT
SCALE 1:20



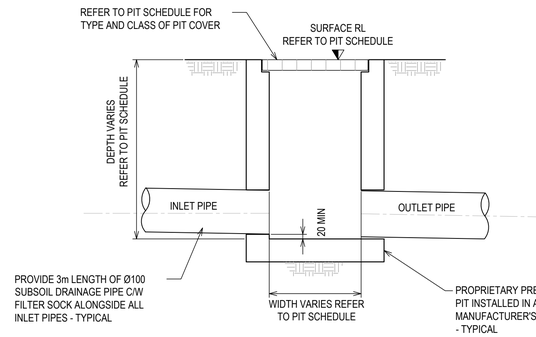
FILTERRA BASIN TYPICAL SECTION

N.T.S



GRATED TRENCH DRAIN DETAIL

SCALE 1:20



STORMWATER DRAINAGE PIT - PRECAST PIT

SCALE 1:20

PRINTING NOTE:
THIS DRAWING TO BE
PRINTED IN COLOUR.

A1 0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 1:50
A1 0 0.5 1.0 1.5 2.0 2.5 1:25
A1 0 0.5 1.0 1.5 2.0 1:20

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

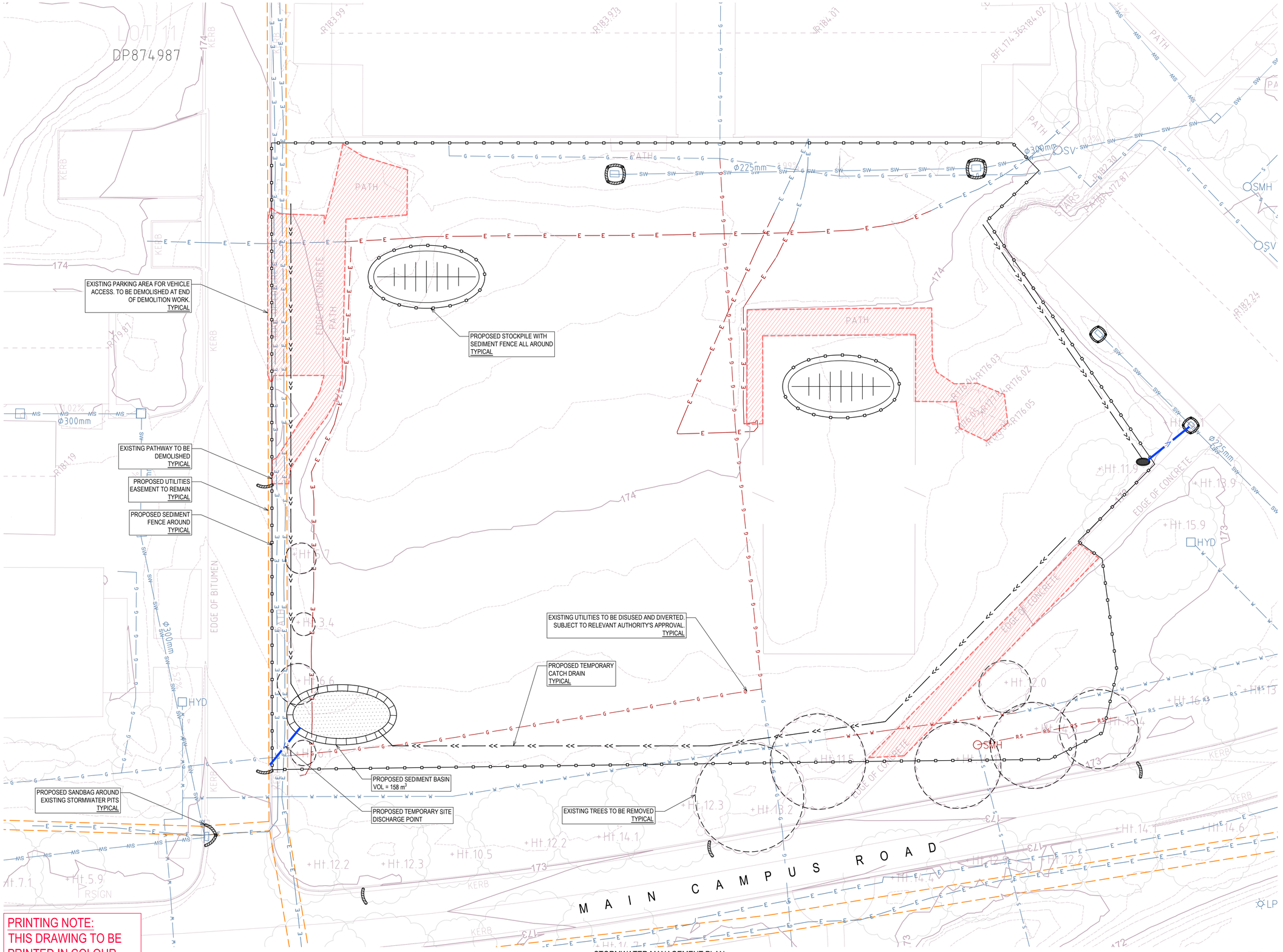
Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
CIVIL DRAINAGE DETAILS - SHEET 2

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024		@ A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE201	B	



PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

STORMWATER MANAGEMENT PLAN
SCALE 1:200

A1 0 1 2 3 4 5 6 7 8 9 10 1:100

LEGEND

- SITE BOUNDARY
- EASEMENT BOUNDARY AND EXTENT
- SEDIMENT FENCE
- EXISTING STRUCTURES TO BE DEMOLISHED
- EXTENT OF WORKS
- EXTENT OF PROPOSED BUILDING
- OVERLAND FLOW DIRECTION
- EXISTING ELECTRICAL LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING UTILITY LINE TO BE DIVERTED
- PROPOSED STOCKPILE LOCATION WITH SEDIMENT FENCE

RUSLE CALCULATION NOTE

REVISED UNIVERSAL SOIL LOSS EQUATION:
A = R * K * Ls * P * C (t/Ha/yr)

$R = 164.74 (1.1177)^{S} * S^{0.6444}$
WHERE S = 14.1 mm/HR
R = 4352
Ls = 0.36 (BASED ON 2% SLOPE FOR 60 m)
K = 0.06 (ASSUMED)
C = 1.0
P = 1.3

A = 122 t/Ha/yr < 150 t/Ha/yr

HENCE, PER TABLE 3.1 OF "BEST PRACTICE EROSION & SEDIMENT CONTROL BOOK 1"
EROSION HAZARD = VERY LOW HAZARD

SEDIMENT BASIN CALCULATION

ASSUMED TYPE D BASIN

VOLUME OF SETTLING ZONE = 10 * R * CV * A
SEDIMENT STORAGE VOL = 50% SETTLING VOLUME

A = 0.4968 Ha
CV = 0.74 (TABLE F2)
$R_{75\%\text{-}5\text{-}DAY}$ = 28.6 (TABLE 6.3A)

SETTLING ZONE = 105 m^3
SEDIMENT STORAGE VOLUME = 53 m^3
SEDIMENT BASIN VOLUME = 158 m^3

BEFORE YOU DIG www.byda.com.au

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

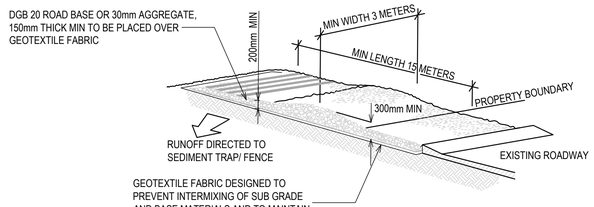
Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
SEDIMENT AND EROSION CONTROL PLAN

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024	1:200	@ A1

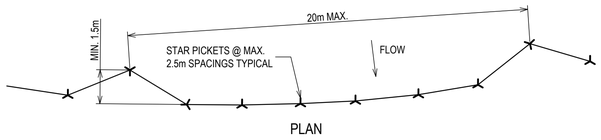
Job Number	Drawing Number	Revision	North Point
SYD2908	CE300	B	



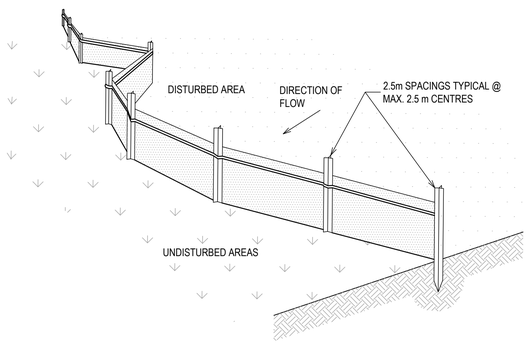
STABILISED SITE ACCESS WITH SHAKER RAMP

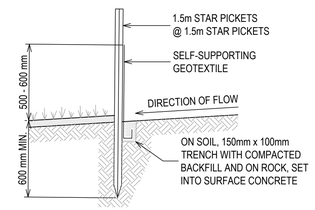
SCALE N.T.S.

NOTES:
1. THIS DEVICE IS TO BE LOCATED AT ALL EXITS FROM CONSTRUCTION SITE.
2. THIS DEVICE IS TO BE REGULARLY CLEANED OF DEPOSITED MATERIAL SO AS TO MAINTAIN A 50mm DEEP SPACE BETWEEN PLANKS.
3. ANY UNSEALED ROAD BETWEEN THIS DEVICE AND NEAREST ROADWAY IS TO BE TOPPED WITH 100mm THICK 40-70mm SIZE AGGREGATE.
4. ALTERNATIVELY, THREE(3) PRECAST CONCRETE CATTLE GRIDS (AS MANUFACTURED BY "HUMES CONCRETE MAY BE USED. 1, 2 & 3 ABOVE ALSO APPLY.



PLAN





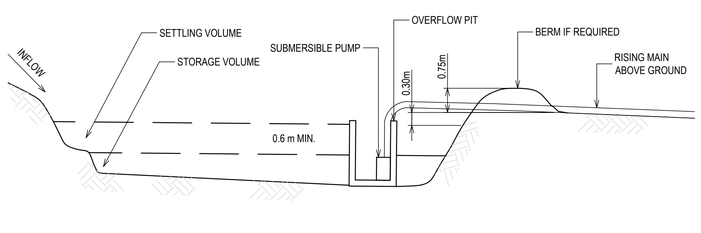
SECTION DETAIL

SEDIMENT FENCE

SCALE N.T.S.

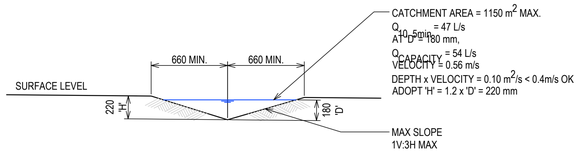
SEDIMENT FENCE CONSTRUCTION NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150 mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 m LONG STAR PICKETS INTO GROUND @ 2.5 m INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150 mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.



TYPICAL SEDIMENT BASIN

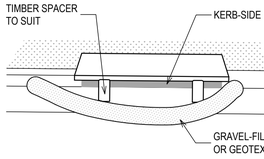
SCALE N.T.S.

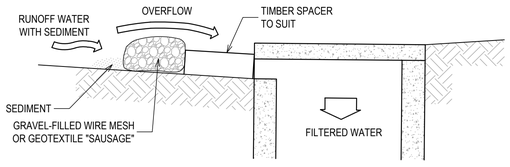


TYPICAL SECTION THROUGH CATCH DRAIN

GENERAL INSTRUCTIONS:

1. THIS SEDIMENT AND EROSION CONTROL WORKS FOR THE SITE SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION, 4TH EDITION (2004)" BY LANDCOM.
2. AS REQUIRED BY COUNCIL, SEDIMENT CONTROL MEASURES WILL BE REQUIRED DURING THE CONSTRUCTION OF ALL DEVELOPMENTS/BUILDING WORKS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY THAT THE WORKS ARE CARRIED OUT IN ACCORDANCE WITH THE SEDIMENT AND EROSION CONTROL PLAN AND COUNCIL'S REQUIREMENTS.
3. THE CONTRACTOR SHALL ENSURE THAT ALL SUBCONTRACTORS ARE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE AREAS.
4. THE NON-DISTURBED PORTION OF THE CATCHMENT OUTSIDE OF OPERATING AREA IS TO BYPASS THE BASINS BY MEANS OF LINED CATCH DRAINS.
5. WHERE PRACTICABLE, THE SOIL EROSION HAZARD SHALL BE KEPT AS LOW AS POSSIBLE. LIMITATIONS TO ACCESS ARE TO BE VIA STANLEY LANE UNLESS OTHERWISE APPROVED BY COUNCIL.
6. ENSURE THAT ALL DRAINS ARE OPERATING EFFECTIVELY AND SHALL MAKE ANY NECESSARY REPAIRS. REMOVE TRAPPED SEDIMENT WHERE THE CAPACITY OF THE TRAPPING DEVICE FALLS BELOW 60%.
7. CONSTRUCT ADDITIONAL EROSION OR SEDIMENT CONTROL WORKS AS MAY BE APPROPRIATE TO ENSURE THE PROTECTION OF DOWNSLOPE LANDS AND WATERWAYS.
8. MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES IN A FULLY FUNCTIONING CONDITION AT ALL TIMES UNTIL THE SITE IS REHABILITATED.
9. REMOVE TEMPORARY SOIL CONSERVATION STRUCTURES AS THE LAST ACTIVITY IN THE REHABILITATION PROGRAM.

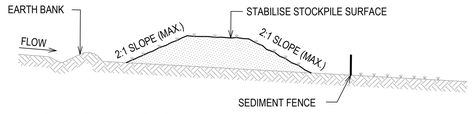




MESH & GRAVEL INLET FILTER CONSTRUCTION NOTES:
1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT / LADEN WATERS CANNOT PASS BETWEEN.

MESH & GRAVEL INLET FILTER

SCALE N.T.S.

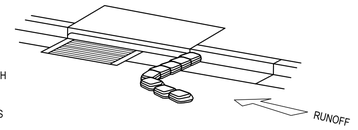


STOCKPILE CONSTRUCTION NOTES:
1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.

STOCKPILES

SCALE N.T.S.

NOTES:
1. PROVIDE THREE LAYERS OF SANDBAGS WITH THEIR ENDS OVERLAPPED AND ALSO OVERLAPPING ONTO THE KERB.
2. CREATE A GAP IN THE SANDBAGS TO ACT AS A SPILLWAY.
3. SANDBAG BARRIER TO BE MIN. 2m FROM THE INLET AND EXTEND MIN. 0.9m OUT FROM THE KERB.



GULLY INLET SANDBAG PROTECTION DETAIL

SCALE N.T.S.

CONSTRUCTION SEQUENCE:

WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:

1. INSTALL SEDIMENT FENCING AND CUT DRAINS TO MEET THE REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLAN. WASTE COLLECTION BINS SHALL BE INSTALLED ADJACENT TO SITE OFFICE.
2. CONSTRUCT STABILISED SITE ACCESS IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.
3. REDIRECT CLEAN WATER AROUND THE CONSTRUCTION SITE.
4. INSTALL SEDIMENT CONTROL PROTECTION MEASURES AT ALL NATURAL AND MAN-MADE DRAINAGE STRUCTURES. MAINTAIN UNTIL ALL THE DISTURBED AREAS ARE STABILISED.
5. CLEAR AND STRIP THE WORK AREAS. MINIMISE THE DAMAGE TO THE GRASS AND LOW GROUND COVER OF NON-DISTURBED AREAS.
6. ANY DISTURBED AREAS, OTHER THAN BUILDING PAD AREAS, SHALL IMMEDIATELY BE COVERED WITH SITE TOPSOIL WITHIN 7 DAYS OF CLEARING. BUILDING PAD AREAS SHALL BE COVERED WITH BITUMEN EMULSION AS SPECIFIED.
7. APPLY PERMANENT STABILISATION TO SITE (LANDSCAPING).

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

A1 0 1 2 3 4 5 6 7 8 9 10 1:100

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
SEDIMENT AND EROSION CONTROL DETAILS

DEVELOPMENT APPLICATION

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC2024		@ A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE305	B	

north

landscape documentation

Wollongbar TAFE Northern Rivers Stage 2

TAFE NSW

65 Sneaths Road Wollongbar

terras landscape architects

DRAWING REGISTER

DRAWING NUMBER	SHEET NAME	REV. No.	REV. DATE	
15237.5 WD L000	COVER PAGE	3	11/7/25	
15237.5 WD L010	SITE PLAN	3	11/7/25	
15237.5 WD L101	LANDSCAPE PLAN 01	2	11/7/25	
15237.5 WD L102	LANDSCAPE PLAN 02	2	11/7/25	
15237.5 WD L103	LANDSCAPE PLAN 03	2	11/7/25	
15237.5 WD L104	LANDSCAPE PLAN 04	2	11/7/25	
15237.5 WD L105	LANDSCAPE PLAN 05	2	11/7/25	
15237.5 WD L106	LANDSCAPE PLAN 05	2	11/7/25	
15237.5 WD L301	GENERAL SETOUT PLAN	2	11/7/25	
15237.5 WD L302	COMPENSATORY HABITAT PLANTING	2	11/7/25	2 NEW SHEET
15237.5 WD L701	TYPICAL DETAILS	2	11/7/25	
15237.5 WD L702	TYPICAL DETAILS	3	11/7/25	
15237.5 WD L801	SPECIFICATION	2	11/7/25	
15237.5 WD L802	SPECIFICATION	2	11/7/25	
15237.5 WD L803	SPECIFICATION	2	11/7/25	
15237.5 WD L804	SPECIFICATION	2	11/7/25	
15237.5 WD L901	SCHEDULES	2	11/7/25	
15237.5 WD L902	SCHEDULES	3	11/7/25	2 REVISED TREE QUANTITIES

B-BLOCK

PROPOSED
MULTI-DISCIPLINARY
TRADES HUB

J-BLOCK

MAIN CAMPUS ROAD

SOUTHERN CARPARK

1 L101

1 L102

1 L103

1 L104

1 L302 COMPLEMENTARY AND OFFSET HABITAT PLANTING

LP

LEGEND

- EXISTING TREES TO BE RETAINED
- EXISTING TREES TO BE REMOVED
- PROPOSED TREES
- PROPOSED PLANTING
- SUPP — SUPPLEMENTARY PLANTING AREA
- PL01 — INDIGENOUS PLANTING REQUIRING COORDINATION
- PL02 — MASS PLANTING
- PV01 — PLAIN CONCRETE
- PV02 — COLOURED OXIDE CONCRETE
- PV03 — COLOURED OXIDE CONCRETE
- PV04 — DECO GRANITE
- R2 — PROPOSED RETAINING WALL
- R1 — EXISTING RETAINING
- CR1, CR2 — CORTEN STEEL RAISED BEDS
- F01 — TREE PROTECTION FENCING

1 L010 SITE PLAN
Scale: 1:1000

REV	DATE	COMMENTS
3	11/7/25	GENERAL UPDATE
2	10/7/25	REVISED PLANT SCHEDULES
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
SITE PLAN

SITE:
65 Sneaths Road Wollongbar

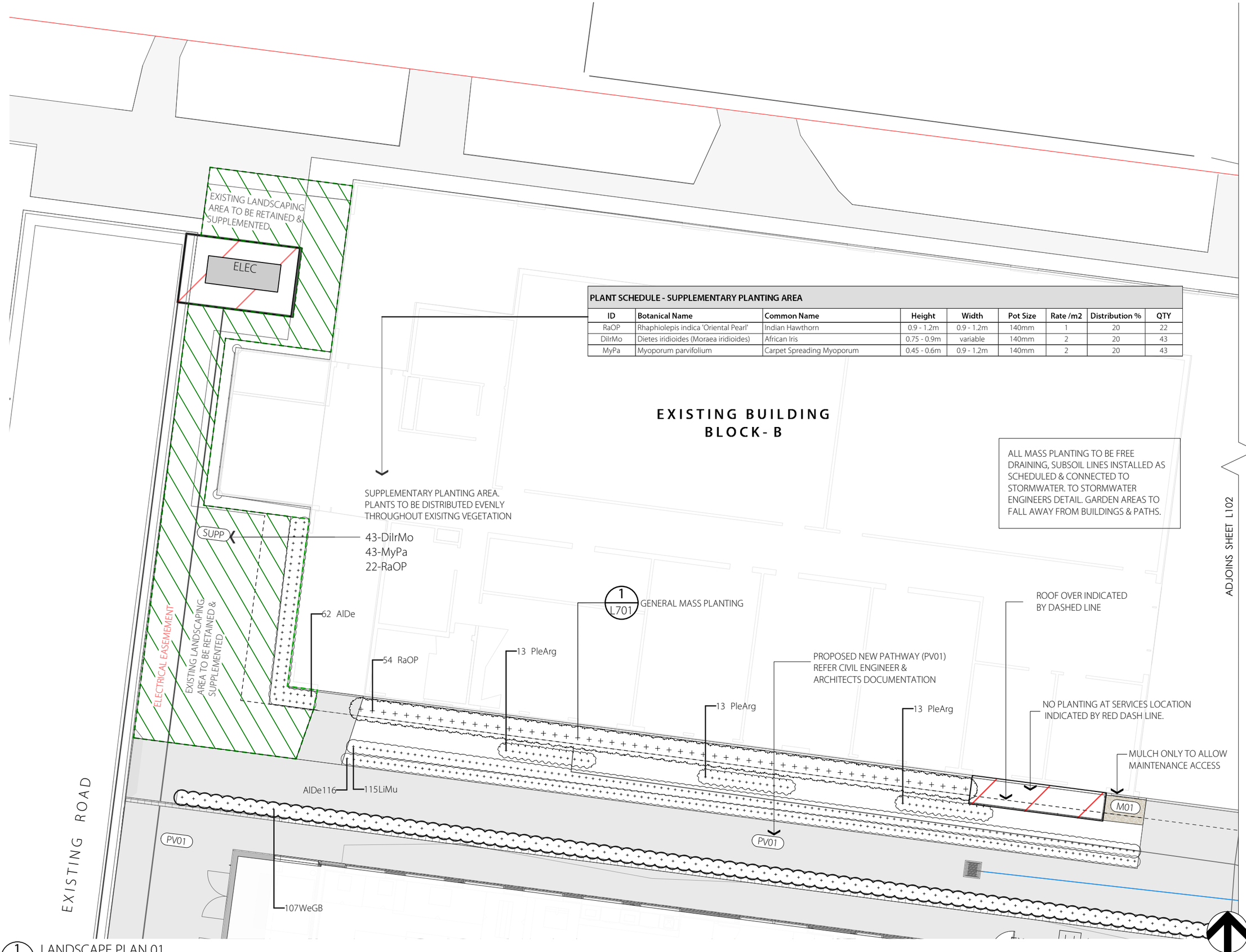
CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2_7/7/25_CC

DRAWN: AN/ KH | DATE: 6/11/24 | SCALE: 1:500@A3

JOB NUMBER: 15237.5 | PHASE: CC | DWG No: L010 | REV: 3

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926



PLANT SCHEDULE - SUPPLEMENTARY PLANTING AREA

ID	Botanical Name	Common Name	Height	Width	Pot Size	Rate /m2	Distribution %	QTY
RaOP	Rhaphiolepis indica 'Oriental Pearl'	Indian Hawthorn	0.9 - 1.2m	0.9 - 1.2m	140mm	1	20	22
DilrMo	Dietes iridioides (Moraea iridioides)	African Iris	0.75 - 0.9m	variable	140mm	2	20	43
MyPa	Myoporum parvifolium	Carpet Spreading Myoporum	0.45 - 0.6m	0.9 - 1.2m	140mm	2	20	43

ALL MASS PLANTING TO BE FREE DRAINING, SUBSOIL LINES INSTALLED AS SCHEDULED & CONNECTED TO STORMWATER. TO STORMWATER ENGINEERS DETAIL. GARDEN AREAS TO FALL AWAY FROM BUILDINGS & PATHS.

LEGEND

- EXISTING TREES TO BE RETAINED
- EXISTING TREES TO BE REMOVED
- PROPOSED TREES
- PROPOSED PLANTING
- SUPP — SUPPLEMENTARY PLANTING AREA
- PL01 — INDIGENOUS PLANTING REQUIRING COORDINATION
- PL02 — MASS PLANTING
- PV01 — PLAIN CONCRETE
- PV02 — COLOURED OXIDE CONCRETE
- PV03 — COLOURED OXIDE CONCRETE
- PV04 — DECO GRANITE
- R2 — PROPOSED RETAINING WALL
- R1 — EXISTING RETAINING
- CR1, CR2 — CORTEN STEEL RAISED BEDS
- F01 — TREE PROTECTION FENCING

1 L101 LANDSCAPE PLAN 01
Scale: 1:150

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
LANDSCAPE PLAN 01

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2/.pln,CC

DRAWN: AN/ GF | DATE: 6/11/24 | SCALE: 1:150@A3

JOB NUMBER: 15237.5 | PHASE: CC | DWG No: L101 | REV: 2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

ADJOINS SHEET L101

ROOF OVER INDICATED BY DASHED LINE

MULCH ONLY AREA. TO ALLOW ACCESS TO HYDRANT

HYDRANT

49 RaOP

5000

2930

FALL

M01

13 PleArg

PROPOSED NEW PATHWAY (PV01) PLAIN CONCRETE FINISH AS SCHEDULED

1 / L701 GENERAL MASS PLANTING

13 PleArg

87 LiMu

90 AlDe

PV01

27 RaOP

27 DiIr

TREES IN MASS PLANTING DETAIL 2 / L701

EXISTING BUILDING BLOCK- B

NEW MULTI-TRADES HUB

TrLa 1

SIGNAGE PROVIDING INFORMATION FOR INDIGENOUS CORRIDOR CLAN TOTEMS AND CLAN PLAQUES

BK01

FALL

R1

R2

EXISTING LANDSCAPING AREA TO BE RETAINED

ALL EXISTING TREES AND VEGETATION TO BE RETAINED.

ALL MASS PLANTING TO BE FREE DRAINING, SUBSOIL LINES INSTALLED AS SCHEDULED & CONNECTED TO STORMWATER. TO STORMWATER ENGINEERS DETAIL. GARDEN AREAS TO FALL AWAY FROM BUILDINGS & PATHS.

PROPOSED NEW TIMBER SLEEPER RETAINING WALL (R2) AS SPECIFIED
TO ADJOIN & EXTEND EXISTING TIMBER SLEEPER RETAINING WALL (R1)
PROPOSED TOW 173.10, INDICATIVE HEIGHT 600H, INDICATIVE LENGTH 25M

PROPOSED NEW DECO GRANITE SURFACE (PV04) AS SPECIFIED

1 TrLa

1220

ADJOINS SHEET L103

1 / L102 LANDSCAPE PLAN 02
Scale: 1:150

LEGEND

- EXISTING TREES TO BE RETAINED
- EXISTING TREES TO BE REMOVED
- PROPOSED TREES
- PROPOSED PLANTING
- SUPP — SUPPLEMENTARY PLANTING AREA
- PL01 — INDIGENOUS PLANTING REQUIRING COORDINATION
- PL02 — MASS PLANTING
- PV01 — PLAIN CONCRETE
- PV02 — COLOURED OXIDE CONCRETE
- PV03 — COLOURED OXIDE CONCRETE
- PV04 — DECO GRANITE
- R2 — PROPOSED RETAINING WALL
- R1 — EXISTING RETAINING
- CR1, CR2 — CORTEN STEEL RAISED BEDS
- F01 — TREE PROTECTION FENCING

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
LANDSCAPE PLAN 02

SITE:
65 Sneaths Road Wollongbar

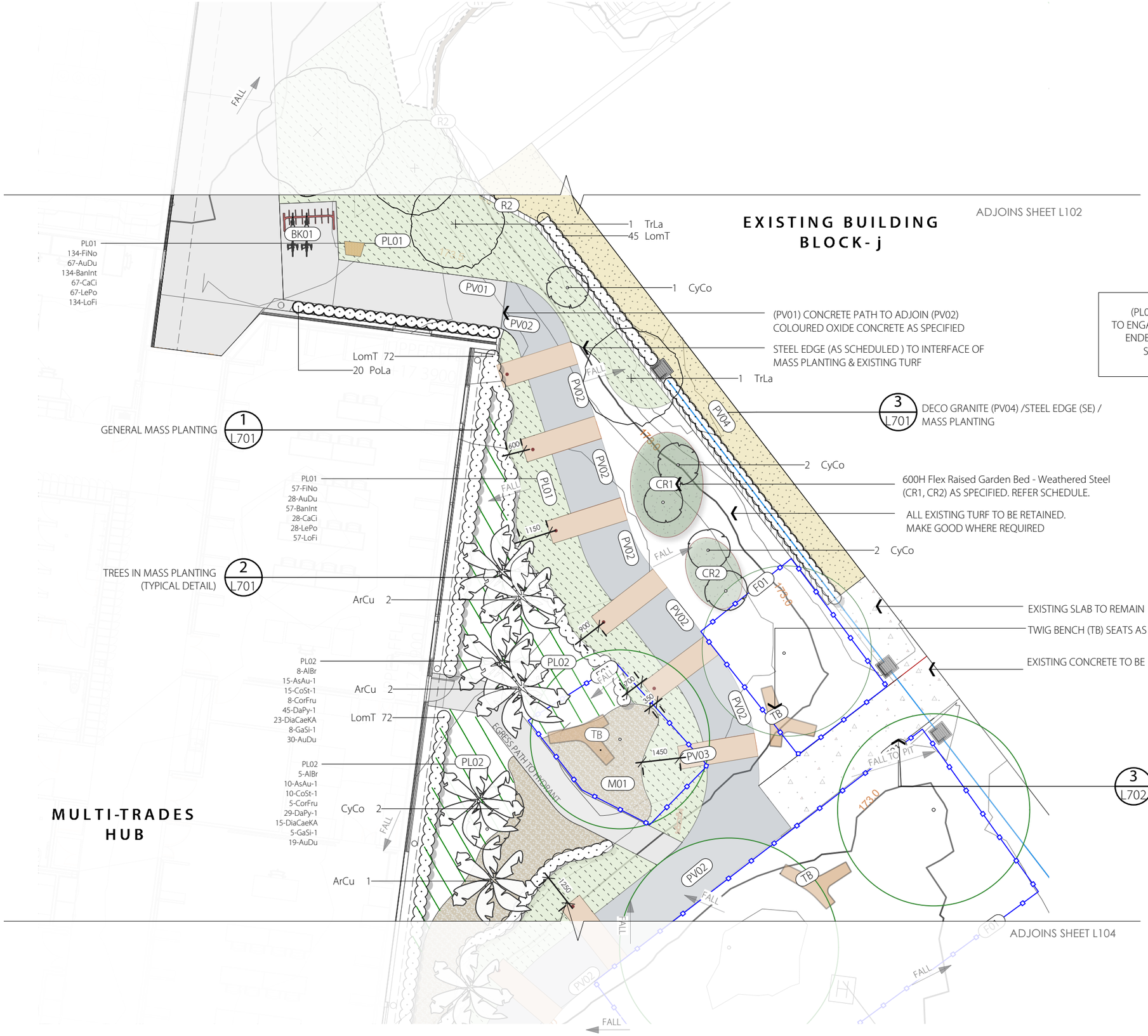
CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2/WZZ.CC

DRAWN:	DATE:	SCALE:
AN/ GF	6/11/24	1:150@A3

JOB NUMBER:	PHASE:	DWG No:	REV:
15237.5	CC	L102	2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926



(PL01) PLANTING TO BE COORDINATED WITH TAFE & TO ENGAGE LOCAL INDIGENOUS NURSERY TO CONFIRM ENDEMIC-INDEIGENOUS CLAN SPECIFIC BUSHTUCKER SPECIES, QUANTITIES, METHOD OF INSTALLATION AND OR POSSIBLE COMMUNITY PLANTING.

EXISTING LEVELS TO REMAIN UNCHANGED AROUND BASE OF ALL EXISTING TREES TO EXTENT OF TPZ

ALL MASS PLANTING TO BE FREE DRAINING, SUBSOIL LINES INSTALLED AS SCHEDULED & CONNECTED TO STORMWATER. TO STORMWATER ENGINEERS DETAIL. GARDEN AREAS TO FALL AWAY FROM BUILDINGS & PATHS.

LEGEND

- EXISTING TREES TO BE RETAINED
- EXISTING TREES TO BE REMOVED
- PROPOSED TREES
- PROPOSED PLANTING
- SUPP — SUPPLEMENTARY PLANTING AREA
- PL01 — INDIGENOUS PLANTING REQUIRING COORDINATION
- PL02 — MASS PLANTING
- PV01 — PLAIN CONCRETE
- PV02 — COLOURED OXIDE CONCRETE
- PV03 — COLOURED OXIDE CONCRETE
- PV04 — DECO GRANITE
- R2 — PROPOSED RETAINING WALL
- R1 — EXISTING RETAINING
- CR1, CR2 — CORTEN STEEL RAISED BEDS
- F01 — TREE PROTECTION FENCING

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
LANDSCAPE PLAN 03

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2/WZZ.CC

DRAWN: AN/ GF | DATE: 6/11/24 | SCALE: 1:150@A3

JOB NUMBER: 15237.5 CC | PHASE: L | DWG No: L103 | REV: 2

1 L103 LANDSCAPE PLAN 02
Scale: 1:150

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

ADJOINS SHEET L103

ADJOINS SHEET L105

3 L702 TREE PROTECTION FENCING
AUSTRALIAN TEAK TREES *Flindersia australis*
TO BE RETAINED & PROTECTED

EXISTING DRAINAGE LINE LOCATION

EXISTING BUILDING BLOCK- J

MULTI-TRADES HUB

2 L104

ALL EXISTING TURF TO BE RETAINED.
MAKE GOOD WHERE REQUIRED.

1 L701 2 L701 GENERAL MASS PLANTING
& TREES IN MASS PLANTING DETAIL

ArCu 1
ArCu 2
LomT 72
CyCo 2

PL01
92-FiNo
46-AuDu
92-BanInt
46-CaCi
46-LePo
92-LoFi

M01
PV01
PV02
PV03
PL01
F01
FALL
1730
4530
H
TB

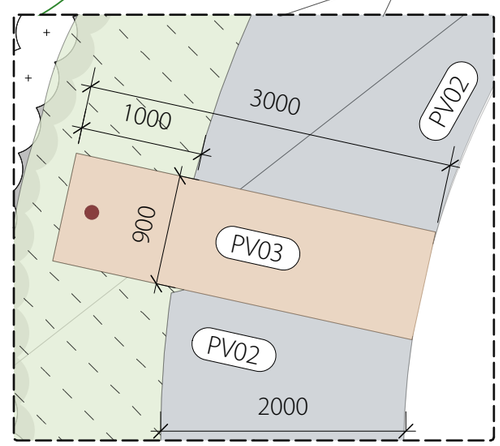
MAIN CAMPUS ROAD

PV02, PV03 COLOURED OXIDE CONCRETE AS SPECIFIED

(M01) AREAS OF MULCH ONLY
TO BE 100MM DEPTH AS SCHEDULED

(PV01) CONCRETE TRANSITION TO
COLOURED CONCRETE (PV02) AS SCHEDULED

(PL01) PLANTING TO BE COORDINATED WITH TAFE &
TO ENGAGE LOCAL INDIGENOUS NURSERY TO CONFIRM
ENDEMIC-INDEIGENOUS CLAN SPECIFIC SPECIES,
SPECIES QUANTITIES, METHOD OF INSTALLATION
AND OR POSSIBLE COMMUNITY PLANTING.



LEGEND

- EXISTING TREES TO BE RETAINED
- EXISTING TREES TO BE REMOVED
- PROPOSED TREES
- PROPOSED PLANTING
- SUPP — SUPPLEMENTARY PLANTING AREA
- PL01 — INDIGENOUS PLANTING REQUIRING COORDINATION
- PL02 — MASS PLANTING
- PV01 — PLAIN CONCRETE
- PV02 — COLOURED OXIDE CONCRETE
- PV03 — COLOURED OXIDE CONCRETE
- PV04 — DECO GRANITE
- R2 — PROPOSED RETAINING WALL
- R1 — EXISTING RETAINING
- CR1, CR2 — CORTEN STEEL RAISED BEDS
- F01 — TREE PROTECTION FENCING

1 L104 LANDSCAPE PLAN 04
Scale: 1:150

2 L104 CONCRETE SLAB/PATH DIMENSIONS
Scale: 1:50

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
LANDSCAPE PLAN 04

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE.
CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING
MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2.VWX25.CC

DRAWN: AN/ GF
DATE: 6/11/24
SCALE: 1:150@A3

JOB NUMBER: 15237.5
PHASE: CC
DWG No: L104
REV: 2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

MULTI-TRADES HUB

CONCRETE FOOTPATHS (PV01)
TO BE PLAIN CONCRETE BROOM FINISH
AS SCHEDULED

PV01

23 PoLa

47 PoLa

1
L701
GENERAL MASS PLANTING

ALL MASS PLANTING TO BE FREE DRAINING, SUBSOIL LINES INSTALLED AS SCHEDULED & CONNECTED TO STORMWATER. TO STORMWATER ENGINEERS DETAIL. GARDEN AREAS TO FALL AWAY FROM BUILDINGS & PATHS.

FALL

FALL

FALL

ALL EXISTING TURF TO BE RETAINED.
MAKE GOOD WHERE REQUIRED.

F01

ALL EXISTING TURF TO BE RETAINED.
MAKE GOOD WHERE REQUIRED.

EXISTING CONCRETE PATH
TO BE RETAINED

ALL EXISTING TURF TO BE RETAINED.
MAKE GOOD WHERE REQUIRED.

PV01

PV01

(PV01) CONCRETE TO ADJOIN (PV02)
AS SCHEDULED

TREE PROTECTION FENCING

3
L702

ADJOINS SHEET L106

ADJOINS SHEET L104

MAIN CAMPUS ROAD

EXISTING CONCRETE PATH
TO BE RETAINED

LEGEND

- EXISTING TREES TO BE RETAINED
- EXISTING TREES TO BE REMOVED
- PROPOSED TREES
- PROPOSED PLANTING
- SUPP — SUPPLEMENTARY PLANTING AREA
- PL01 — INDIGENOUS PLANTING REQUIRING COORDINATION
- PL02 — MASS PLANTING
- PV01 — PLAIN CONCRETE
- PV02 — COLOURED OXIDE CONCRETE
- PV03 — COLOURED OXIDE CONCRETE
- PV04 — DECO GRANITE
- R2 — PROPOSED RETAINING WALL
- R1 — EXISTING RETAINING
- CR1, CR2 — CORTEN STEEL RAISED BEDS
- F01 — TREE PROTECTION FENCING

1
L105
LANDSCAPE PLAN 05
Scale: 1:150

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
LANDSCAPE PLAN 05

SITE:
65 Sneaths Road Wollongbar

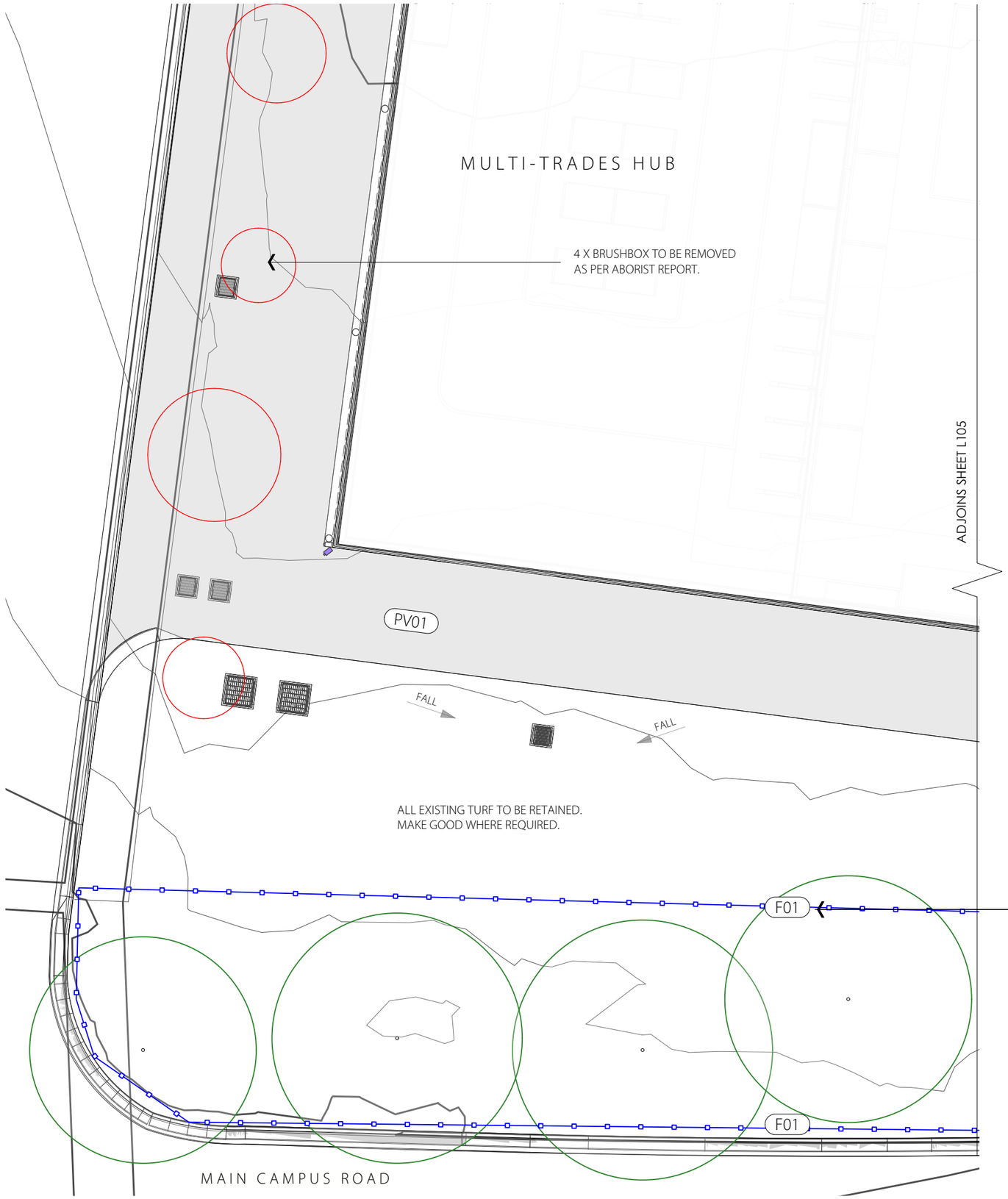
CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE.
CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2.vwx

DRAWN:	DATE:	SCALE:
AN/ GF	6/11/24	1:150@A3

JOB NUMBER:	PHASE:	DWG No:	REV:
15237.5	CC	L105	2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926



1 L106 LANDSCAPE PLAN 05
Scale: 1:150

LEGEND

- EXISTING TREES TO BE RETAINED
- EXISTING TREES TO BE REMOVED
- PROPOSED TREES
- PROPOSED PLANTING
- SUPP — SUPPLEMENTARY PLANTING AREA
- PL01 — INDIGENOUS PLANTING REQUIRING COORDINATION
- PL02 — MASS PLANTING
- PV01 — PLAIN CONCRETE
- PV02 — COLOURED OXIDE CONCRETE
- PV03 — COLOURED OXIDE CONCRETE
- PV04 — DECO GRANITE
- R2 — PROPOSED RETAINING WALL
- R1 — EXISTING RETAINING
- CR1, CR2 — CORTEN STEEL RAISED BEDS
- F01 — TREE PROTECTION FENCING

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
LANDSCAPE PLAN 05

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE.
CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2_V22.CC

DRAWN: AN/ GF
DATE: 6/11/24
SCALE: 1:150@A3
JOB NUMBER: 15237.5
PHASE: CC
DWG No: L106
REV: 2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

SIGNAGE PROVIDING INFORMATION FOR INDIGENOUS CORRIDOR CLAN TOTEMS AND CLAN PLAQUES

13 STATIONS TO REPRESENT BUNDJAUNG CLANS CREATING A STURY TELLING WALK THROUGH THE PROPOSED INIDGENOUS CORRIDOR.

STATIONS TO BE OF EQUAL SIZE AND DESIGN STYLE FOR INSCLUSIVITY.

CLAN STATIONS TO INCLUDE TOTEM POLE WITH INDIGENOUS ARTWORK, CLAN PLINTH WITH STORY TO READ AND ENGAGE.

BUSHTUCKER - ENDEMIC SPECIES (PL01) TO SURROUNDING AREAS AS INDICATED ON SHEETS L104, L104

TWIG BENCH SEATS AS SPECIFIED

EXISTING CONCRETE PATH TO BE RETAINED AND TIE IN SMOOTHLY WITH PROPOSED NEW FOOTPATH.

CLAN TOTEMS LAYOUT AND FINAL DESIGN PENDING INDIGENOUS ENGAGEMENT AND COMMUNITY INPUT INTO THE PLACEMENT OF THE ARTWORKS AND THE INFORMATION IN AND AROUND THE 13 TOTEMS.

(PL01) PLANTING TO BE COORDINATED WITH TAFE & TO ENGAGE LOCAL INDIGENOUS NURSERY TO CONFIRM ENDEMIC-INDEIGENOUS CLAN SPECIFIC BUSHTUCKER SPECIES, QUANTITIES, METHOD OF INSTALLATION AND OR POSSIBLE COMMUNITY PLANTING.

FOR CLAN TOTEM POLES AND PLINTH MATERIALS REFER SCHEDULE ITEMS. FINAL DESIGN MATERIALS PENDING INDIGENOUS AND COMMUNITY CONSULTATION.

LEGEND

- EXISTING TREES TO BE RETAINED
- EXISTING TREES TO BE REMOVED
- PROPOSED TREES
- PROPOSED PLANTING
- SUPP — SUPPLEMENTARY PLANTING AREA
- PL01 — INDIGENOUS PLANTING REQUIRING COORDINATION
- PL02 — MASS PLANTING
- PV01 — PLAIN CONCRETE
- PV02 — COLOURED OXIDE CONCRETE
- PV03 — COLOURED OXIDE CONCRETE
- PV04 — DECO GRANITE
- R2 — PROPOSED RETAINING WALL
- R1 — EXISTING RETAINING
- CR1, CR2 — CORTEN STEEL RAISED BEDS
- F01 — TREE PROTECTION FENCING
- CLAN TOTEM POLES
- CLAN STORY PLINTHS

1 L301 GENERAL SETOUT PLAN
Scale: 1:150

2 L301 GENERAL SETOUT PLAN
Scale: 1:150

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
GENERAL SETOUT PLAN

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2/2022.CC

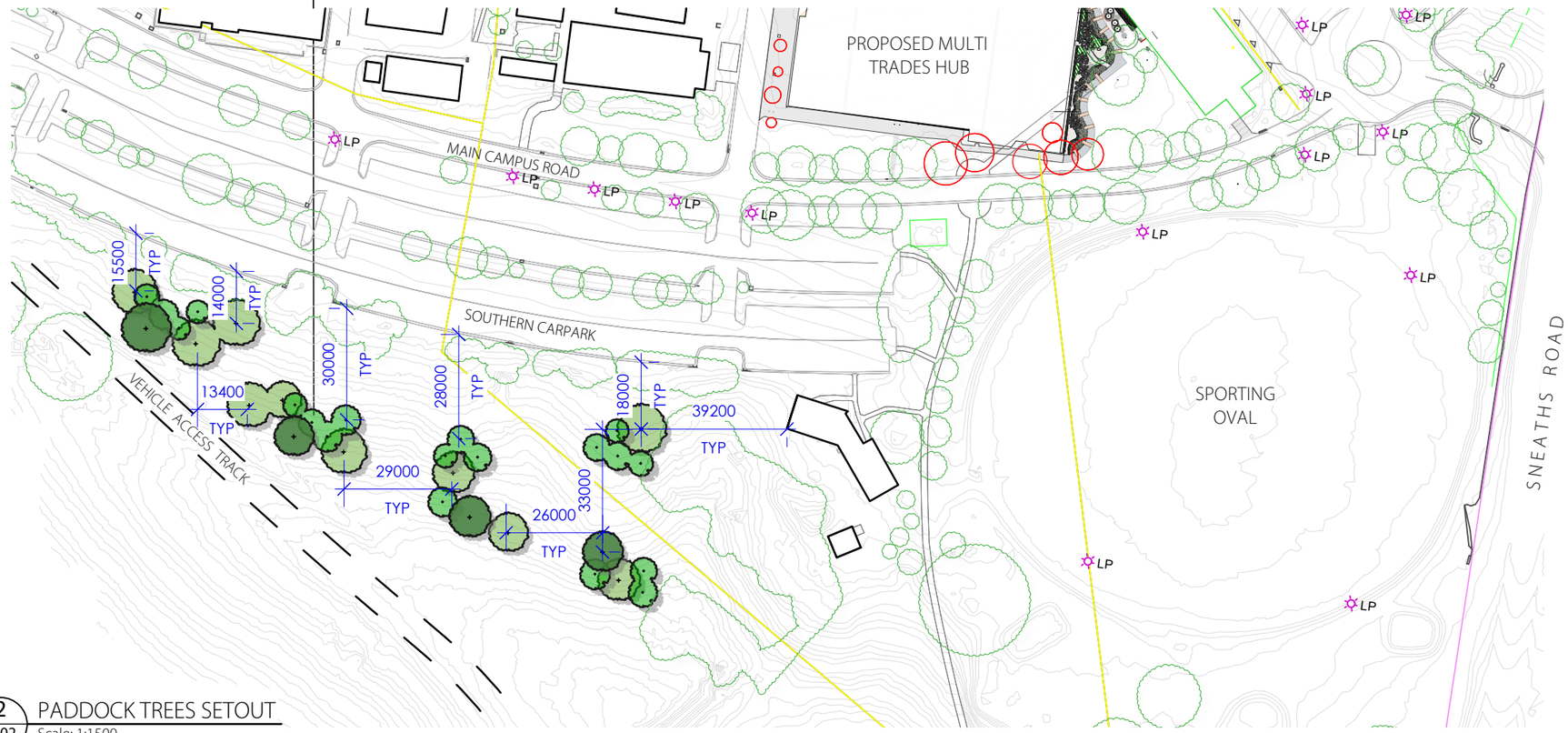
DRAWN: AN/ GF | DATE: 6/11/24 | SCALE: 1:150@A3

JOB NUMBER: 15237.5 | PHASE: CC | DWG No: L301 | REV: 2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

1 L302 TREE PLANTING LOCATIONS
Scale: 1:3000

1 L702 2 L702 TREES IN TURF PLANTING DETAIL



2 L302 PADDOCK TREES SETOUT
Scale: 1:1500

1

PLANT SCHEDULE -FORAGING FOREST TREES

ID	Botanical Name	Common Name	Height	Width	Pot Size	QTY
ArCu	Archontophoenix cunninghamiana	Bangalow Palm	10-15m	10-15m	45ltr	9
CyCo	Cyathea cooperi	Coin Spotted Tree Fern	3.5 - 6m	3.5 - 6m	45ltr	7
GrBe	Grevillea baileyana	White Oak/Bailey's Silky Oak	8 - 15m	5 - 10m	45ltr	1
TrLa	Tristaniopsis laurina	Kanooka, Water Gum	5 - 10m	3.5 - 6m	45Ltr	3

2

PADDOCK TREES

ID	Botanical Name	Common Name	Height	Width	Pot Size	min. Spacing	QTY
CaSe	Callicoma serratifolia	Black Wattle	Height	Spread	25Ltr	2m centres	19
FlAu	Flindersia australis	Crows Ash	Height	Spread	45Ltr	5m centres	10
LoCo	Lophostemon confertus	Brushbox	Height	Spread	45Ltr	5m centres	4

TOTAL PROPOSED TREES = 53

Compensatory Habitats and Offsets Policy

A requirement under Chapter 2a of the Ballina Council DCP 2012.
The proposed development includes removal of 10 native trees, which under the policy are considered High Biodiversity Value Vegetation. These 10 trees therefore must be offset at a rate of 5:1.

This *Offset Management Plan* considers the following:

- Calculation of 5:1 offset requires a minimum of 50 Trees to be scheduled for planting across the project site.
- Tree species selected from the same plant community type of the removed species, primarily to mitigate the effects of the tree removal and re-establish a similar vegetation type with habitiat potential.
- Required minimum tree establishment & maintenance period of five years. Refer Schedules Sheet L902

LEGEND

- EXISTING VEGETATION RETAINED
- EXISTING TREES TO BE REMOVED
- PROPOSED TREES *Flindersia australis*
- *Lophostemon confertus*
- *Callicoma serratifolia*
- SEWER LINE
- OVERHEAD POWERLINE

Offset Planting Notes

1. 20 x Native trees specified for the TAFE grounds, Indigenous corridor and foraging forest. Refer Sheets L103, L104, detail sheets and Sheet L902 for plant schedules
2. 33 x Native Trees specified beyond southern car parking area where space allows, planted in groups of 5 or more trees with mulch to base. Refer planting details on Sheet L702. Also refer plant schedules on L902 for tree species, quantities, spacing, pot size.

   Dimension offsets from carpark kerb and approximate distances between tree copses are indicative only.

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	10/7/25	REVISED PLANT SCHEDULES

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
COMPENSATORY HABITAT PLANTING

SITE:
65 Sneaths Road Wollongbar

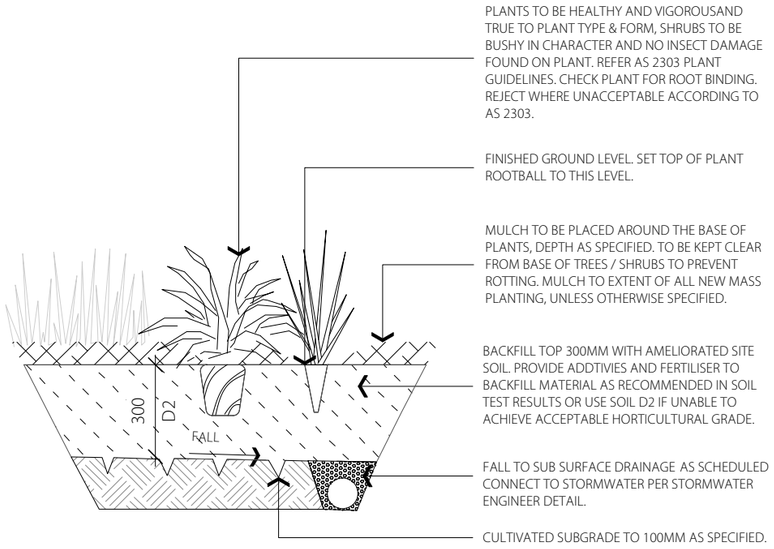
CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2.VWX,CC

DRAWN: AN/ GF | DATE: 6/11/24 | SCALE: 1:150@A3

JOB NUMBER: 15237.5 | PHASE: CC | DWG No: L302 | REV: 2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926



PLANTS TO BE HEALTHY AND VIGOROUSAND TRUE TO PLANT TYPE & FORM, SHRUBS TO BE BUSHY IN CHARACTER AND NO INSECT DAMAGE FOUND ON PLANT. REFER AS 2303 PLANT GUIDELINES. CHECK PLANT FOR ROOT BINDING. REJECT WHERE UNACCEPTABLE ACCORDING TO AS 2303.

FINISHED GROUND LEVEL. SET TOP OF PLANT ROOTBALL TO THIS LEVEL.

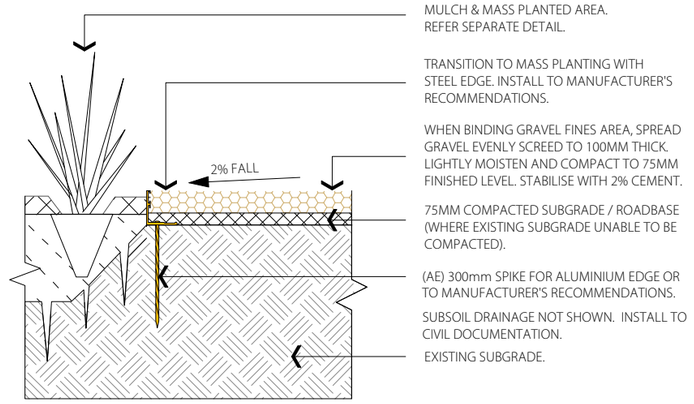
MULCH TO BE PLACED AROUND THE BASE OF PLANTS, DEPTH AS SPECIFIED. TO BE KEPT CLEAR FROM BASE OF TREES / SHRUBS TO PREVENT ROTTING. MULCH TO EXTENT OF ALL NEW MASS PLANTING, UNLESS OTHERWISE SPECIFIED.

BACKFILL TOP 300MM WITH AMELIORATED SITE SOIL. PROVIDE ADDTIVIES AND FERTILISER TO BACKFILL MATERIAL AS RECOMMENDED IN SOIL TEST RESULTS OR USE SOIL D2 IF UNABLE TO ACHIEVE ACCEPTABLE HORTICULTURAL GRADE.

FALL TO SUB SURFACE DRAINAGE AS SCHEDULED CONNECT TO STORMWATER PER STORMWATER ENGINEER DETAIL.

CULTIVATED SUBGRADE TO 100MM AS SPECIFIED.

1 L701 MASS PLANTING DETAIL (TYPICAL)
Scale: 1:20



MULCH & MASS PLANTED AREA. REFER SEPARATE DETAIL.

TRANSITION TO MASS PLANTING WITH STEEL EDGE. INSTALL TO MANUFACTURER'S RECOMMENDATIONS.

WHEN BINDING GRAVEL FINES AREA, SPREAD GRAVEL EVENLY SCREED TO 100MM THICK. LIGHTLY MOISTEN AND COMPACT TO 75MM FINISHED LEVEL. STABILISE WITH 2% CEMENT.

75MM COMPACTED SUBGRADE / ROADBASE (WHERE EXISTING SUBGRADE UNABLE TO BE COMPACTED).

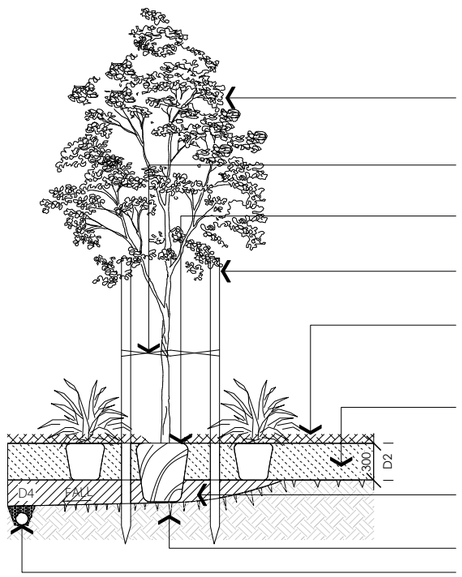
(AE) 300mm SPIKE FOR ALUMINIUM EDGE OR TO MANUFACTURER'S RECOMMENDATIONS.

SUBSOIL DRAINAGE NOT SHOWN. INSTALL TO CIVIL DOCUMENTATION.

EXISTING SUBGRADE.

3 L701 DECO GRANITE (PVO4) / STEEL EDGE (SE)/ MASS PLANTING
Scale: 1:20

ALL MASS PLANTING TO BE FREE DRAINING, SUBSOIL LINES INSTALLED AS SCHEDULED & CONNECTED TO STORMWATER. TO STORMWATER ENGINEERS DETAIL. GARDEN AREAS TO FALL AWAY FROM BUILDINGS & PATHS.



SCHEDULED TREES TO MEET AS 2303 GUIDELINES AS PER SPECIFICATIONS. WRITTEN CERTIFICATION REQUIRED FROM PURCHASER PRIOR TO INSTALLATION.

HESSIAN TIES IN FIGURE OF EIGHT PATTERN AFFIXED TO STAKES. ENSURE STEM MOVEMENT PERMITTED IN LIGHT WIND CONDITIONS.

TOP OF ROOTBALL LEVEL WITH TOP OF SOIL SURFACE.

PROVIDE 2 X 50 X 50 X 2400MM HARDWOOD STAKES. DRIVE INTO SOLID GROUND, ENSURING ROOT BALL IS NOT PENETRATED.

75MM MULCH AS SPECIFIED.
ENSURE MULCH IS KEPT FREE OF TREE TRUNK.

BACKFILL TOP 300MM WITH AMELIORATED SITE SOIL.
PROVIDE ADDTIVIES AND FERTILISER TO BACKFILL MATERIAL AS RECOMMENDED IN SOIL TEST RESULTS TO ACHIEVE D2 SOIL PERFORMANCE, OR USE SOIL D2 PREMIUM GRADE GROWING MEDIA IF UNABLE TO ACHIEVE PERFORMANCE CRITERIA WITH AMELORIATED SITE SOIL.

EXCAVATE DEPTH OF ROOTBALL IN SCALLOPED SHAPE AND FALL TO SUB SURFACE DRAINAGE. CULTIVATE SUB GRADE AND PROVIDE GYPSUM TO BASE OF PIT. BACKFILL BELOW 300MM WITH SOIL TYPE D4, SOIL BLEND AS SPECIFIED.

CULTIVATED SUBGRADE.

FALL SUBGRADE TO SUB SURFACE DRAINAGE AND CONNECT TO STORMWATER.

2 L701 TREES IN MASS PLANTING (TYPICAL)
Scale: 1:50

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
TYPICAL DETAILS

SITE:
65 Sneaths Road Wollongbar

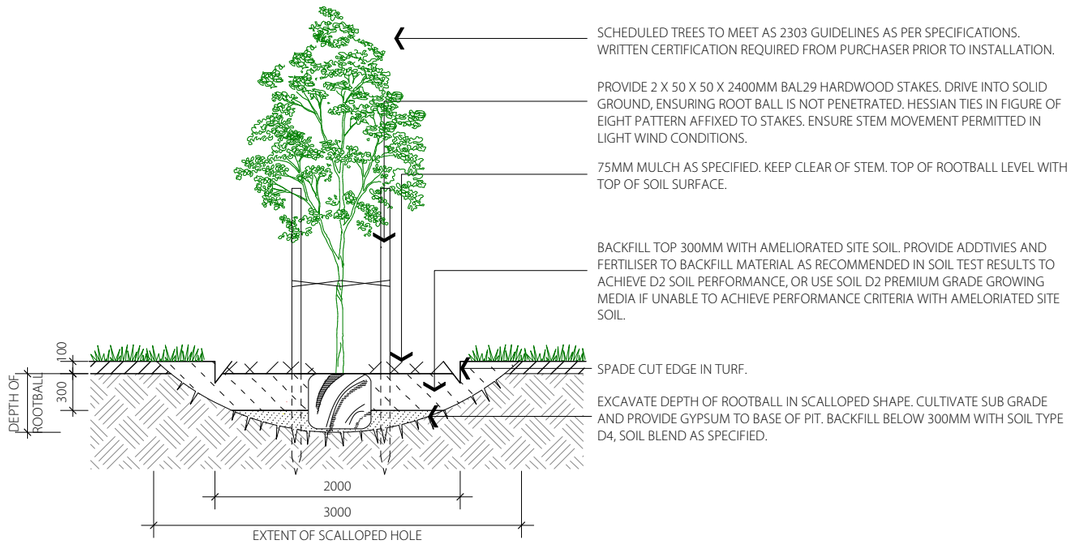
CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2.VWX25.CC

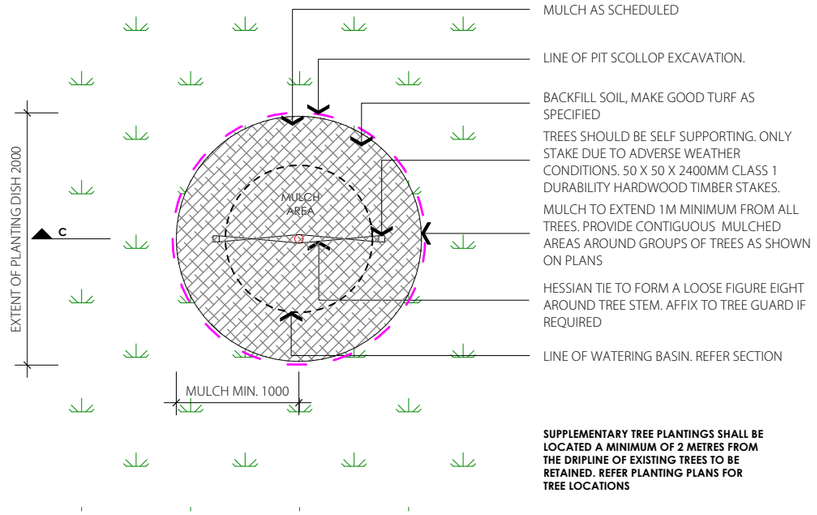
DRAWN:	DATE:	SCALE:
AN/ GF	6/11/24	@A3

JOB NUMBER:	PHASE:	DWG No:	REV:
15237.5	CC	L701	2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

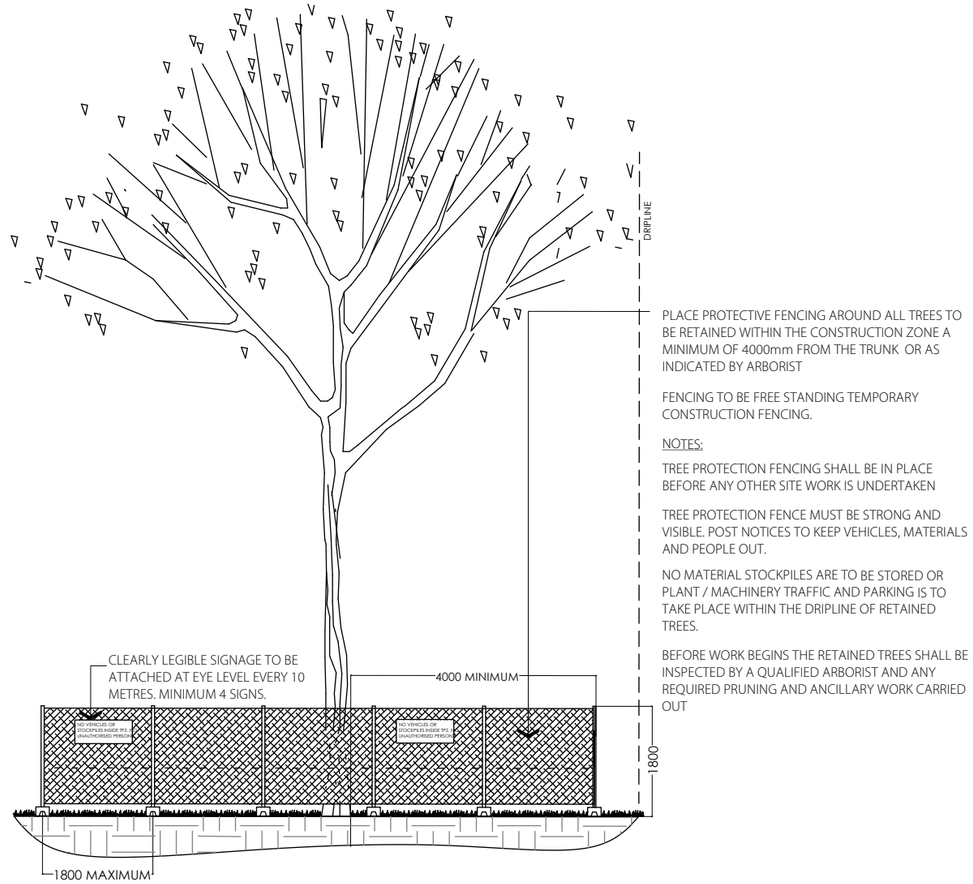


1 L702 TREES IN TURF WITH SPADE EDGE
Scale: 1:50



SUPPLEMENTARY TREE PLANTINGS SHALL BE LOCATED A MINIMUM OF 2 METRES FROM THE DRIPLINE OF EXISTING TREES TO BE RETAINED. REFER PLANTING PLANS FOR TREE LOCATIONS

2 L702 TREES IN TURF WITH SPADE EDGE (PLAN VIEW)
Scale: 1:50



3 L702 TREE PROTECTION FENCING
Scale: 1:100

REV	DATE	COMMENTS
3	11/7/25	GENERAL UPDATE
2	10/7/25	REVISED PLANT SCHEDULES
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
TYPICAL DETAILS

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2.VWX25.CC

DRAWN: AN/ GF
DATE: 6/11/24
SCALE: @A3

JOB NUMBER: 15237.5
PHASE: CC
DWG No: L702
REV: 3

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

TECHNICAL SPECIFICATION

1. GENERAL REQUIREMENTS

1.1 Hold Points + Witness Points
Notify the landscape superintendent at critical hold points for inspection and approval before proceeding – **ESSENTIAL – REFER TO APPENDIX - SCHEDULE FOR HOLD POINTS**

1.2 General

1.3 Performance Standards
Structural: If required, provide structures, installations and components as follows:
AS/NZS 1170.0 Structural design actions
AS 2303 Tree Stock for Landscape Use 2018
AS 4454 Composts, Soil Conditioners and Mulches 2012
AS 4970 Protection of Trees on Development Sites 2009
NCC G1 Minor Structures and Components.
Soils for Landscape Development, Selection, Specification & Validation (Leake & Haege) - 2024
Landscape, Hard and Soft: All landscape works shall be carried out by members of Landscape NSW & ACT or who are eligible to successfully obtain membership.

1.4 Design
Design by contractor: If the contractor provides design, use only appropriately qualified persons and conform to all statutory requirements.

1.5 Conflict with the documents – Omissions + Discrepancies
if there is a conflict between building drawings and specifications, the specifications take precedence, meaning that the details outlined in the written specifications will govern the construction even if they seem to contradict the visual representation on the drawings.

Drawings generally show design intent as is customary and possible with respect to the professional discipline of their author, but neither each and every unique detail nor every element in the sphere of a detail is necessarily *shown*.
Specifications generally *describe* materials, execution and performance requirements, and scope requirements not given by drawings or schedules.
Works Description presents Contract requirements and design intent in various ways but does not purport to comprehensively represent each and every item, component, detail or method required to execute the Works.

If it is believed that a conflict exists between statutory requirements and the documents, or this specification and the construction documents notify the contract administrator immediately and provide a recommendation to resolve the conflict before proceeding with work. Any assumptions or interpretations are the responsibility of the contractor.

1.6 Referenced Documents

Contractual relationships General: Responsibilities and duties of the principal, contractor and contract administrator are not altered by requirements in the documents referenced in this specification.

1.6.1 Current editions
General: Only work to construction drawings that have been issued with a Revision marked 'For Construction'. Working with drawings other than marked 'For Construction' may result in wrong work and is the responsibility of the landscape contractor.

1.6.2 Contract documents
- The contractor is deemed to have thoroughly analysed all documents proffered to tenderers by the principal, and to have made a thorough examination of the Site.
- Discovered all omissions and discrepancies as may exist within those proffered documents and which a competent and
- experienced contractor performing that analysis and examination could have discovered.
- Made do allowance in its tender for the resolution of each such omission or discrepancy **advised** by the **Principal** to the tenderer, or if no such advice is given, for the resolution of it that affords the higher quality and value to the **Principal**.

1.6.3 Services diagrammatic layouts
General: Layouts of service lines, plant and equipment shown on the drawings are diagrammatic only, except where figured dimensions are provided or calculable.
Before commencing work: Obtain measurements and other necessary information.
Coordinate the design and installation in conjunction with all trades.

1.6.4 Levels
General: Spot levels take precedence over contour lines and ground profile lines.
Conflict: Engineering levels take precedence over landscape levels, any discrepancies must be raised for clarification with the landscape architect

1.6.5 Drawings and manuals for existing services
Warranty: No warranty is given as to the completeness or accuracy of drawings and/or manuals of existing services. Undertake additional investigations as required.

1.7 Submissions
Submit to: Terras Landscape Architects
Default timing: Make submissions at least 5 working days before ordering products or starting installation of the respective portion of the works.
Non-compliance: Identify proposals for non-compliance with project requirements, and characteristics which may be detrimental to successful performance of the completed work.

1.7.1 Authority approvals
Authorities' approvals: Submit documents showing approval by the authorities whose requirements apply to the work.

1.7.2 Certification
General: Submit certification that the equipment submitted meets all requirements of the contract documents.

1.7.3 Samples
Submission: Submit nominated samples.
Incorporation of samples: If it is intended to incorporate samples into the works, submit proposals. Incorporate samples in the works which have been endorsed for inclusion. Do not incorporate other samples.
Retention of samples: Keep endorsed samples in good condition on site, until the date of practical completion.

1.7.4 Tests
General: Submit an inspection and testing plan which is consistent with the construction program. Include particulars of test stages and procedures.
Test reports: Submit written reports on nominated tests.

1.7.5 Ordering
Requirement: Within 14 days of the date of acceptance of tender, furnish proof of ordering the required materials, and advise immediately if any supply difficulties are encountered.
Substitutions shall not be approved unless accepted in writing by the Superintendent. The plant schedule shall be the accepted document for plant quantities and sizes to be used for the project. Where discrepancies arise between the drawings and the plant schedule seek clarification from the Superintendent as soon as practicable.

1.8 Products

1.8.1 Manufacturers' or suppliers' recommendations
General: Transport, deliver, store, handle, protect, finish, adjust and prepare for use the manufactured items in conformance with the current written recommendations and instructions of the manufacturer or supplier. Advise of activities that supplement, or are contrary to, manufacturers or suppliers' written recommendations and instructions.

1.8.2 Prohibited materials
Do not provide the following:
- Materials listed in the Safe Work Australia Hazardous Substances Information System
- Materials that use chlorofluorocarbon (CFC) or hydro chlorofluorocarbon (HCFC) in the manufacturing process.
- No uncontrolled or dry cutting of manufactured stone shall be permitted

1.8.3 Substitutions
Identified proprietary items: Identification of a proprietary item does not necessarily imply exclusive preference for the item so identified but indicates the necessary properties of the item.
Alternatives: If alternatives to the documented products, methods or systems are proposed, submit sufficient information to permit evaluation of the proposed alternatives, including the following:
- Evidence that the performance is equal to or greater than that specified
- Samples
- Essential technical information, in English
- Reasons for the proposed substitutions
- Statement of the extent of revisions to the contract documents
- Statement of cost implications including costs outside the contract
- If the documented products or systems are unavailable within the time constraints of the construction program, submit evidence.

1.9 Tests

1.9.1 Testing authorities
- Except for site tests, have tests carried out by a registered testing authority and submit test reports.
- Reports: Submit copies of test reports, including certificates for type tests, showing the observations and results of tests and conformance or non-conformance with requirements.

1.9.2 Materials and components

1.9.3 Consistency
General: For each material or product use the same manufacturer or source and provide consistent type, size, quality and appearance.

2. PRELIMINARIES

2.1 The Site

2.1.1 Site restrictions
Access: Access on to and within the site, use of the site for temporary works and constructional plant, including working and storage areas, location of offices, workshops, sheds, roads and parking, is subject to the restrictions of the contractor with responsibility for the site.

2.1.2 Protection of persons and property
Temporary works: Provide and maintain required hoardings, barricades, guards, fencing, shoring, temporary roadways, footpaths, signs, lighting, watching and traffic flagging.
Access ways, services: Do not obstruct or damage roadways and footpaths, drains and watercourses and other existing services in use on or adjacent to the site. Determine the location of such services.
Property: Do not interfere with or damage property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site, and trees.

2.1.3 Rectification
Access ways, services: Rectify immediately any obstruction or damage to roadways and footpaths, drains and watercourses and other existing services in use on or adjacent to the site. Provide temporary services whilst repairs are carried out.
Property: Rectify immediately any interference or damage to property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site, and trees.

2.1.4 Existing services
General: Attend to existing services as follows:
- If the service is to be continued, repair, divert or relocate. Submit proposals.
- If the service crosses the line of a required trench, or will lose support when the trench is excavated, provide permanent support for the existing service. Submit proposals.
- Check with engineer's drawings to see extent of earthwork, drainage, changes in and location of services, coordinated works as required. Landscape contractor to advise project superintendent asap of required under path conduits, power and water connections needed for irrigation installation to ensure co-ordination. Ensure drainage installed to base of mass planting beds.
- Proposals: Submit proposals for action to be taken with respect to existing services before starting this work. Minimise the number and duration of interruptions.

2.1.5 Protective clothing
Protective clothing: Make available protective clothing for the use of visitors.
Safety helmets: To AS/NZS 1801, Type 1.
Certification: Required.
- Certification provider: An organisation accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

2.1.6 Temporary fence
Requirement: Contractor to provide fencing to secure site during construction. Contractor to nominate location and alignment of fencing, to be approved by principal's representative.

2.1.7 Project signboards
- Provide project-specific signboards and as follows:
- Locate where directed.
- Maintain in good condition for duration of the work.
- Remove on completion.

2.1.8 Survey Marks
The term survey mark means a survey peg, benchmark, reference mark, signal, alignment, level mark or any other mark used or intended to be used for the purpose of setting out, checking or measuring the work. Before commencing work:
- Obtain measurements and other necessary information.
- Verify that survey marks to be used are correct and undisturbed, and that the setting-out data in the Works Description or otherwise provided to the Contractor correctly correlates to them.
- Preserve and maintain the owner's survey marks in their true positions.
- If the owner's survey marks are disturbed or obliterated, immediately give notice and rectify the disturbance or obliteration.

2.1.9 Safety
Accidents: Promptly notify the architect of the occurrence of the following:
- Accidents involving death or personal injury.
- Accidents involving loss of time.
- Incidents with accident potential such as equipment failure, slides and cave-ins.
- Accident reports: Submit reports of accidents.
- Purpose of submission: Information only.

2.1.10 Contractor's representative
General: Must be accessible, and fluent in English and technical terminology.

2.1.11 Subcontracting
General: Submit a complete list of proposed subcontractors and suppliers.

2.2 Program of work
Construction program: Show the following:
- Sequence of work.
- Critical paths of activities related to the work.
- Activity inter-relationships.
- External dependencies including provision of access, document approvals and work by others.
- Periods within which various stages or parts of the work are to be executed.

Time scale: Working days.
Updated program: Identify changes since the previous issue and show the estimated percentage of completion for each item of work.
Program chart: Display in the contractor's site office an up-to-date bar chart and network diagram based on the construction program.

2.2.1 Site meetings
- Hold and attend site meetings throughout the contract and arrange attendance of appropriate subcontractors, the landscape architect, and appropriate consultants as required.
- Minutes: Keep minutes of site meetings. Within 5 working days after each meeting, submit to each party written copies of the minutes.
- Contacts: At the first site meeting, submit names and telephone numbers of responsible persons who may be contacted after hours during the contract.
- Purpose of submission: Information only.

2.2.2 Progress photographs
General: Take colour digital photos of any damaged site works for records prior to commencement to verify damage prior to project commencement otherwise damage shall be the responsibility of the landscape contractor.

2.3 Completion of the works

2.3.1 Final cleaning
General: Before the date for practical completion, clean throughout, paved surfaces and walls. Clean debris from the site and drainage systems. Remove waste and surplus materials.
Samples: Remove non-incorporated samples, prototypes and sample panels.

2.3.2 Reinstatement
General: Before the date for practical completion, clean and repair damage caused by installation or use of temporary work and restore existing facilities used during construction to original condition.

2.3.3 Removal of plant
General: Within 10 working days after practical completion, remove temporary works and construction plant no longer required. Remove the balance before the end of the defect's liability period.

3. EXECUTION

3.1.1 Removal of material – Off Site Disposal
Dispose of construction waste material off site to the requirements of the relevant authorities.

3.1.2 Fixing
Use proprietary fasteners capable of transmitting the loads imposed, and sufficient for the rigidity of the assembly.

3.1.3 Warranties
If a warranty is documented or if a manufacturer's standard warranty extends beyond the end of the defect's liability period, name the principal as warrantee. Register with manufacturers as necessary. Retain copies delivered with components and equipment.

Commence warranty periods at practical completion or at acceptance of installation, if acceptance is not concurrent with practical completion.

Approval of installer: If installation is not by manufacturer, and product warranty is conditional on the manufacturer's approval of the installer, submit the manufacturer's written approval of the installing firm.

3.2 Operation and Maintenance Manuals

3.2.1 General
General: Submit operation and maintenance manuals for landscape and play elements, irrigation and softfall as provided by the manufacturers, including:: Certificates from authorities, copies of manufacturers' warranties, product certification.

3.3 Date for submission: At practical completion.

3.3.1 Completion tests
Inspection: Give sufficient notice for inspection to be made of the commissioning and completion testing of the installation.

3.3.2 Samples
General: Remove unincorporated samples on completion.

3.3.3 Cleaning
General: Before the date for practical completion, clean throughout, including all surfaces except those totally and permanently concealed from view.
Labels: Remove all labels not required for maintenance.

4. TREE PROTECTION

4.1 Generally
General: Comply with the recommendations of those parts of AS 4970 which are referenced in this work section.
Warning sign: Display a sign in a prominent position at each entrance to the site, warning that trees and plantings are to be protected during the contract. Remove on completion.
Protection measures program: Before commencement of earthworks.

4.1.1 Trees to be retained
Extent: All trees NOT marked for removal.

4.1.2 Tree protection
Do not add or remove topsoil within the Tree Protection Zone (TPZ) or drip line (whichever is the greater. Tree protective measures: To AS 4970 Section 4.

4.1.3 Work near trees
Harmful materials: Keep the area within the dripline free of sheds and paths, construction material and debris. Do not place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks. Prevent wind-blown materials such as cement from harming trees and plants.
Damage: Prevent damage to tree bark. Do not attach stays, guys and the like to trees.
Work under trees: Do not remove topsoil from, or add topsoil to, the area within the dripline of the trees.

4.2 Excavation:
If excavation is required near trees to be retained, give notice and obtain instructions. Open up excavations under tree canopies for as short a period as possible.

4.2.1 Hand methods:
Use hand methods to locate, expose and cleanly remove the roots on the line of excavation. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged.
Roots: Do not cut tree roots exceeding 50 mm diameter. Where it is necessary to cut tree roots, use means such that the cutting does not unduly disturb the remaining root system. Immediately after cutting, water the tree and apply a liquid rooting hormone to stimulate the growth of new roots.

4.2.2 Compacted ground:
Do not compact the ground or use skid-steel vehicles under the tree dripline. If compaction occurs, give notice and obtain instructions.

4.2.3 Compaction protection:
Protect areas adjacent the tree dripline. Submit proposals for an elevated platform to suit the proposed earthworks machinery.

4.2.4 Watering:
Water trees directly after planting and as necessary, including where roots are exposed at ambient temperature more than 35°C.

4.2.5 Existing services
General: Do not excavate by machine within 1 m of existing underground services.
Requirement: Before commencing earthworks, locate and mark existing underground services in the areas which will be affected by the earthwork's operations including clearing, excavating and trenching.
Utility services: Contact DIAL BEFORE YOU DIG to identify location of underground utility services pipes and cables.

4.3 Trees to be removed

4.3.1 Designation
Extent: Refer to landscape drawings.
Marking: Mark trees to be removed as follows:
Tags: Surveyor's ribbon
Location: 1000mm above ground

4.4 Site clearing
General: Clear only the following site areas:
- Areas to be occupied by works such as structures, paving, excavation, regrading and landscaping.
- Other areas designated to be cleared.

4.4.1 Clearing and grubbing
Clearing: Remove everything on or above the site surface, including rubbish, scrap, grass, vegetable matter and organic debris, scrub, trees, timber, stumps, boulders and rubble.
Grubbing: Grub out stumps and roots over 75 mm diameter to a minimum depth of 500 mm below subgrade under embankments or paving, or 300 mm below finished surface in unpaved areas. Backfill holes remaining after grubbing with sand material to prevent ponding of water. Compact the material to the relative density of the existing adjacent ground material.

4.4.2 Execution
Repair: Undertake tree surgery and make good damage to existing trees noted to be retained.
Operations: Remove dead and decayed wood or limbs that have been broken. Make all cuts at branch collars. If trees show signs of deterioration after the work has been done, carry out a program of soil amelioration such as soil aeration, irrigation or incorporation of organic material. Continue this program until the end of the plant establishment period.
Root pruning: Do not unduly disturb the remaining root system. Cut off damaged roots cleanly inside the exposed or damaged area. Cover exposed root area with soil immediately. Do not leave roots exposed.
Wetting and new root stimulation: Form a water collecting basin and apply a rooting hormone and wetting agent to the root ball.

4.5 Sediment filters

4.5.1 General
Inspection: Inspect for displacement, undercutting, over-topping and soil build-up, after each rain event. Effect repairs immediately.
Removal: When the upslope areas have been permanently stabilised.

4.6 Disposal of materials
Spoil: Remove cleared and grubbed material from the site and dispose of legally.

4.7 Mulch
Seed free aerial vegetative matter put through a chipper. Reduce to pieces not larger than 75 x 50 x 15 mm and stockpile for re-use as mulch.
Material not permitted: Leaf matter and tree lopping's from privet, camphor laurel, coral tree, poplar, willow and noxious weeds.

5. DEMOLITION

5.1 Definitions
General: For the purposes of this work section, the following definitions apply:
- Demolition: The complete or partial dismantling of a building or structure, by pre-planned and controlled methods or procedures.
- Dismantle: The reduction of an item to its components in a manner to allow re-assembly.
- Recover: The disconnection and removal of an item in a manner to allow re-installation.

5.2 Inspection
Notice Give notice so that inspection may be made of the following:
- Trees as documented to be retained; protection fence installed before commencement of demolition.
- Site after removal of demolished materials.

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
SPECIFICATION

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2 /ANZS.CC

DRAWN:	DATE:	SCALE:
AN/ GF	6/11/24	@A3

JOB NUMBER:	PHASE:	DWG No:	REV:
15237.5	CC	L801	2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

5.3 Submissions

5.3.1 Stockpiles
Location: Submit the locations for on-site stockpiles for demolished materials for recycling in the works. Coordinate with the locations of storage for other waste streams and prevent mixing or pollution.

5.3.2 Off-site disposal
Disposal location: Submit the locations and evidence of compliance with the relevant authorities for the disposal of material required to be removed from the site.

5.4 Dilapidation photos
Undertake existing condition photos of all structures and landscape, at commencement to verify existing condition including trees to be retained.

5.5 Air quality control
General: Protect adjoining owners, residents and the public against dust, dirt and water nuisance and injury. Use dust screens and watering to reduce the dust nuisance.

5.6 Lighting of fires
Prohibition: Do not light fires.

5.7 Vegetation and fauna
Wild life protected: All native.
Trees to be removed: Inspect to establish if nesting native fauna are present. If present give notice. Pruning: To AS 4373.

5.8 Water quality
Wash out: Make sure that wash out does not enter waterways or stormwater drains.
Cross connection: Make sure that there are no cross connections between the stormwater and the public sewerage system.

5.9 Dewatering
General: Keep earthworks free of water. Provide and maintain slopes, crowns and drains on excavations and embankments to make sure free drainage. Place construction, including fill, masonry, concrete and services, on ground from which free water has been removed. Prevent water flow over freshly laid work.

5.10 Temporary landscape fencing

5.10.1 Fence types
Steel Panels : Height: 1800 mm. mesh panels with frame, moveable.
Maximum post spacing: 1800 mm.

Wire Fencing Corner and gate posts: Hardwood or preservative-treated softwood, 250 mm diameter. Intermediate posts: Star picket.
Gates: Provide a suitable hinged gate with a gate latch.
Wire: Top, intermediate and bottom rows of 3.2 mm plain galvanized steel wire. Thread the top wire through pieces of plastic tube and through corner posts.

5.10.2 Removal
Completion: Remove the fence at the end of the practical completion certificate issue.

6. SITE PREPARATION

6.1 Erosion and sedimentation control
Undertake all required site management and sedimentation control

6.1.1 Removal of topsoil
Extent: Areas of cut or fill and areas occupied by structures, pavements and embankments.
Maximum depth: 200 mm. Check if stripping is part of civil works otherwise include in scope.

6.2 Excavation
Site surface: Excavate over the site to give correct levels and profiles as the basis for structures, pavements, filling and landscaping. Make allowance for compaction, settlement or heaving.

6.2.1 Existing services
Location: Before commencing earthworks, locate and mark existing underground services in the areas which will be affected by the earthwork's operations including clearing, excavating and trenching.
Utility services: Contact DIAL BEFORE YOU DIG to identify location of underground utility services pipes and cables.
Excavation: Do not excavate by machine within 1 m of existing underground services.

6.2.2 Disposal of excess excavated material
General: Remove excess excavated material from site not required or unsuitable for fill unless otherwise approved to leave on site.
Standard: To AS 3798 clause 6.1.8.

6.2.3 Stockpiled topsoil
Cultivation: Rip to a depth of 150 mm or to the depth of rippable, subgrade if less. Cultivate around services and tree roots by hand. Trim to allow for the required topsoil depth.
Herbicide: Do not apply before placing topsoil.
Placing: Spread and grade evenly.

6.2.4 Disposal of excess topsoil
On-site: Dispose of surplus topsoil remaining on site if approved by spreading evenly over the areas already placed. Place only in locations and depths approved by Principal. Otherwise dispose off site. Ensure confirmation in scope and tender.
Off-site: Remove excess topsoil from the site and dispose of legally.

7. STORMWATER – SITE

7.1 Scope
Allow to provide sub soil drains to, but not limited to, all mass planting beds, behind walls, edge of turf at down slope interface with hardscape area, edges of synthetic turf where interfacing with downslope hardscape surfaces and under playground and rubber softfall areas. Subsoil drains may be shown on landscape plans or civil plans, connect to suitable pits or drainage system.

7.1.1 Inspection
Inspection: Give notice so that inspection may be made at the following stages:
- Excavated surfaces with subsoil drainage installed.
- Concealed or underground services prior to being covered.
- Upon completion prior to backfilling with planting soil.

7.2 Submissions
Tests: Submit results from pre-completion leak testing.
Certification: Submit certificate stating that network is leak free upon completion.

7.3 Subsoil drainage
Filter: Conform to AS/NZS 3500.3 clause 2.14.2.

7.3.1 General
Requirement: Provide subsoil drains to intercept groundwater seepage and prevent water build-up behind walls and under pavements. Connect subsoil drains to surface drains or to the stormwater drainage system as applicable.
Ensure that under concrete conduits are installed for subsoil drainage connections to be made (where applicable).
Subsoil drainage MAY be indicated on landscape or civil engineers plans where necessary to intercept groundwater seepage and prevent water build up behind retaining walls and under pavement. Connect subsoil drains to the stormwater drainage system. Refer to plans and details.

7.3.2 Pipe surrounds
General: Place the material in the pipe surround in layers ≤ 200 mm loose thickness and compact without damaging or displacing the piping. Backfill over subsoil drainage lines need to be fee draining material or gravel to allow water to seek into the subsoil drain. Do not backfill over with hard dense or clayey soils.
Depth of overlay:
- To the underside of the bases of overlying structures such as pavements and channels.
- To within 150 mm of the finished surface of unpaved or landscaped areas.

7.4 Pits
General: Clean and flush the whole installation.

7.5 Planter boxes – above ground

7.5.1 Standard: AS 4652.2
Above ground planter boxes shall be constructed in accordance with standard. refer to detail Figure 2.17 Planter Box Construction. Install all waterproofing membranes, protection boards, sealants, overflow pipe risers and flashings as per the AS detail. Install PVC overflow risers to each base drainage outlet.

7.5.2 Planter boxes – waterproofing membrane
Above ground planter boxes shall be waterproofed with a weldable polypropylene waterproofing sheet membrane specially formulated for landscape planters compliant to AS 4564.1
Recommended compliant product: ARDEX 'Weldec' Root Repell. Install to manufacturers recommendations and technical datasheet. Approval of the selected membrane shall be confirmed and accepted by the builder prior to installation.

8. EARTHWORKS

8.1 Standards
Earthworks: To AS 3798.

8.2 Inspection
Inspection: Give notice so that inspection may be made of the following:
- Areas to be cleared and/or stripped of topsoil
- Areas stripped of topsoil
- Excavation completed to contract levels or founding material
- Filling completed to contract levels

8.2.1 General
Finish: Finish the surface to the required level, grade and shape within the following tolerances:
- Under load bearing elements: + 0, - 25 mm.
- Pavement subgrades: + 0, - 40 mm.
- Batters: No steeper than the slope shown on the drawings. Make sure flatter slopes do not impact on boundaries or required clearances to buildings, pavements or landscaping.
- Other ground surfaces: ± 50 mm, provided the area remains free draining and matches adjacent construction where required. Provide smoothness as normally produced by a scraper blade.

8.3 Topsoil stockpiles
General: Stockpile site topsoil intended for re-use and imported topsoil where necessary.
Stockpile heights: Establish stockpiles to maximum height of 1.5 m.
Mark: Identify stockpiles of different soil types.
Vegetation: Do not burn off or remove plant growth which may occur during storage.
Protection: Provide the following:
- Drainage and erosion protection.
- Do not allow traffic on stockpiles.
- If a stockpile is to remain for more than four weeks, sow with temporary grass.
- Protect the topsoil stockpiles from contamination by other excavated material, weeds and building debris.

8.4 Submissions
Design Calculations: Submit calculations by a professional engineer to show that proposed excavations and temporary supports, including where applicable supports for adjacent structures, will be stable and safe.

8.4.1 Tests
Compaction: Submit certification and/or test results in conformance with the specified level of responsibility to AS 3798.

9. LANDSCAPE – SOILS

9.1 Standards
The contractor may source soil from site or external sources, suppliers but must provide testing results from SESL from soil supplied to site intended for use or from a nursery or supplier before.

The soil sampling must be current [within 5 working days of supply to site]. The soil test results must be undertaken by a NATA certified laboratory and list any soil amelioration including rates and types. The contractor shall undertake that amelioration as part of the contract works, the cost of this is to be covered by the landscape contractor.

9.2 Soil Types
Refer Soils for Landscape Development, Selection, Specification and Validation, by Simon Leake and Elke Haege (2024) for soil testing requirements and minimum criteria.
See schedules for required soil type for the project:

Soil Type	Depth	Type	Location
C1	100mm	Passive Amenity Turf	
C2	100mm	Active High Traffic Turf	
C3		Sports Field Turf	
D1	Top 400mm	Mass Planting Soil	
D2	Top 300mm	Garden Bed Soil:	On grade planting
D3	Top 400mm	Display Bed Soil	High nutrient
D4	Below 300mm	Garden Bed Soil	Tree vault subsoil
E1	Top300mm	On Slab Soil	Raised planters
E2	Below 300mm	On Slab Soil:	Raised planters
E3	Container	On Slab Soil:	Low density containers
F1	Refer detail	Structural support soil	Tree pits
F2	Refer detail	Raingardens	Biofiltration/stormwater features
F3	Refer detail	Wetland Soils	Basins/wetlands

9.3 Inspections
Inspection: Give notice so that inspection may be made of the following:
- Subgrades excavated and cultivated or prepared for placing topsoil **[ESSENTIAL] .**
- Topsoil spread before planting.
- Grassing bed prepared before turfing.

9.4 Submissions

9.4.1 Materials
Supplier's data: Submit supplier's data including the following:
- SESL Soil test results and any recommended soil amelioration for the proposed soil sampled. Provide evidence before placing into the landscape.
- Absence of any weed propagules or contaminants.
- pH and CEC
- Macro and micro nutrients.
- OM
- Sodic analysis
- Ameliorants recommendation: If required to include ameliorants, recommend the source of ameliorant material, rates and methods of incorporation.

9.4.2 Vegetative spoil
Spoil suitable for mulch or spreading for bushland restoration: Spread freshly harvested native plant biomass, free of weed propagules.
Unsuitable material: Remove vegetative spoil from site. Do not burn.

9.5 Subsoil

9.5.1 Ripping
General: Rip parallel to the final contours wherever possible. Do not rip when the subsoil is wet or plastic. Do not rip within the dripline of trees and shrubs to be retained. Smooth gradients that have not been ripped or scarified will not retain topsoil and will be rejected.
Ripping depths: Rip the subsoil to the following typical depths:
- Refer to schedules for ripping cultivation depths

9.6 Planting beds
Excavated: Excavate to bring the subsoil to at least 375 mm below finished design levels [allowing for 300 soil and 100mm mulch unless otherwise schedules in the schedules. Shape the subsoil to fall to subsoil drains where applicable. All mass planting beds must be provided with subsoil drainage lines connected to a suitable stormwater disposal system.
Unexcavated: Remove weeds, roots, builder's rubbish and other debris.

9.6.1 Cultivation
Minimum depth: Refer to schedules for depths

Services and roots: Do not disturb services or tree roots and if necessary, cultivate these areas by hand. Thoroughly mix in materials required to be incorporated into the subsoil. Cultivate manually within 300 mm of paths or structures. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to design levels after cultivation.

9.7 Additives
As specified from soil test results required. Provide copy to superintendent prior to proceeding.

9.8 Placing topsoil
Site topsoil: Do not incorporate site topsoil into the works until soil testing certification has been approved. Remove unauthorised and excavated material from the site.
General: Spread the topsoil on the prepared subsoil and grade evenly, making the necessary allowances to permit the following:
- Required finished levels and contours may be achieved after light compaction.
- As detailed in the landscape drawings

9.9 Spreading:
On steep batters, if using a chain drag, ensure there is no danger of batter disturbance.

9.10 Finishing:
Feather edges into adjoining undisturbed ground.

9.11 Surplus topsoil
General: Spread surplus topsoil on designated areas on site only if approved. If no designated areas dispose of surplus topsoil off site. Assume that excess soil shall be removed as part of this contract.

9.12 Soil Levels
Finished soil levels shall allow turf to be finished level to the top of timber edging, pavement or as otherwise shown on drawings. Finished soil levels shall allow mulch to be finished with a 25mm set down from the top of timber edging, pavement or as otherwise shown.
Drainage:
The contractor shall incorporate drainage to the bottom of the area of soil as indicated in the working drawing, which connects to the stormwater system. Provide free drainage aggregate above drainage lines to the top of new soil levels to ensure vertical drainage from surface.
Placing Soil:
Place the approved soil on the prepared subsoil. Spread and grade evenly, making the necessary allowances so that the required finished levels and contours may be achieved after light compaction. Prevent areas of excess compaction being caused by constructional plant. Avoid differential subsidence and produce a finished soil
- smooth and free from stones or lumps of soil.
- graded to drain freely, without ponding, to catchment points.
- graded evenly into adjoining

10. LANDSCAPE – TURF

10.1 Inspection

10.1.1 Notice
Inspection: Give notice so that inspection may be made of the following
- Setting out completed.
- Grassing bed prepared before turfing, seeding, or temporary grassing.
- Grassing or turfing completed.

10.1.2 Execution
Program: Submit a work program for the landscape works.
Material storage on site: Submit proposal.

10.1.3 Supply Lead Times
Place early orders for materials and products at the commencement of the project. Not time extensions will be permitted due to products being unavailable unless advised at the commencement of the project.

10.2 Weed eradication
Herbicide: Eradicate weeds using environmentally acceptable methods, such as a non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.
Manual weeding: Regularly remove, by hand, rubbish and weed growth throughout grassed, planted and mulched areas. Remove weed growth from an area 750 mm diameter around the base of the trees in grassed areas. Continue eradication throughout the course of the works and during the planting establishment period.

10.3 Turf
Supplier: Obtain turf from a specialist grower of cultivated turf.
Quality: Provide turf of even thickness, free from weeds and other foreign matter.
Elapsed time: Deliver the turf within 24 hours of cutting and lay it within 36 hours of cutting. Prevent it from drying out between cutting and laying. If it is not laid within 36 hours of cutting, roll it out on a flat surface with the grass up, and water as necessary to maintain a good condition.

10.3.1 Laying
General: Lay the turf in the following manner:
- In stretcher pattern with the joints staggered and close butted.
- Parallel with the long sides of level areas, and with contours on slopes.
- To finish flush, after tamping, with adjacent finished surfaces of ground, paving edging, or grass seeded areas.
- Maximum 10mm gap between turf roll edges.
- Infill all gaps with sandy loam.
- Turf underlay
- General: The mix must meet all the requirements of AS 4419 – Landscape Soils for Soil Blends
- In the event of a discrepancy, the specifications provided below must take precedence. It is recommended to test for other nutrients and trace elements and the opinion of a qualified soil agronomist sought as to suitability of the levels.
- The soil mix is designed to provide maximum drainage rate and compaction resistance. Water and nutrient holding capacity is enhanced by the addition of some soil but the matrix is very sandy. A very small amount of particulate organic matter (e.g. pine bark) is acceptable to provide better water holding without impeding drainage to sustain turf growth. If the sand contains some fine material lesser
- amounts of soil than those suggested may be required. A small amount of fertiliser is added to promote rapid initial root growth.
- Location: Installed at a depth of 100mm

10.3.2 Tamping
General: Lightly tamp to an even surface immediately after laying. Do not use a roller.

10.3.3 Pegging
Stabilising: On steep slopes peg the turf to prevent downslope movement. Remove the pegs when the turf is established.

10.3.4 Fertilising
General: Mix the fertiliser thoroughly into the topsoil before placing the turf. See schedules for fertiliser details.

10.3.5 Watering
General: Water immediately after laying until the topsoil is moistened to its full depth. Continue watering to maintain moisture to this depth.

10.3.6 Mowing
Height: Mow to maintain the grass height within the required range. Do not remove more than one third of the grass height at any one time. Carry out the last mowing within 7 days before the end of the planting establishment period. Remove grass clippings from the site after each mowing.

10.4 Maintenance
General: Maintain turfed areas until the attainment of a dense continuous sward of healthy grass over the whole turfed area, evenly green and of a consistent height.
Failed turf: Lift failed turf and relay with new turf.
Levels: Where levels have deviated from the design levels after placing and watering, lift turf and regrade topsoil to achieve design levels.

10.4.1 Top dressing
General: When the turf is established mow, remove cuttings and lightly top dress to a depth of 10 mm. Rub the dressing well into the joints and correct any unevenness in the turf surface. Assume that top dressing will be required for all projects to infill any joint gaps.

11. LANDSCAPE PLANTING

11.1 General
General: Provide planting, as documented.
Suitability: It shall be assumed that the landscape contractor has reviewed the species list for planting prior to ordering.

The landscape contractor shall be responsible for the maintenance and ongoing replacement of all dead, diseased plants for the period of the specified plant establishment period. There shall be no release from this requirement unless the landscape contractor has advised the landscape architect in writing that a plant is unsuitable and that they will not cover it under the contract, and this is approved by the landscape architect.

Replacement planting due to vandalism or theft is to be allowed for in the contract unless limitations are stipulated by the contractor in their tender and accepted by the client at tender.

11.2 Notice
Inspection: Give notice so that inspection may be made at the HOLD POINT AND WITNESS POINTS listed in the Appendix Schedule tables this document.

11.3 Planting plan quantities
For contract requirement, plant numbers on the plan shall be take preference to the planting schedule if discrepancies are found. Contact the landscape architect for clarification where discrepancies for clarification occur prior to ordering.

11.4 Fertiliser
Provide proprietary fertilisers, delivered to the site in sealed bags marked to show manufacturer or vendor, weight, fertiliser type, N:P:K ratio, recommended uses and application rates, as documented in the Fertiliser schedule.
Application rate: As per manufacturers recommendation. Vary the application rate to allow for the plant available immediate fertilizer equivalence value of the soil conditioning compost.

11.5 Plants
Supply plants to the following quality:
- are vigorous, well established, free from disease and pests, of good foliage, have large healthy root systems, with no evidence of root curl, restriction or damage.
- are hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.
- do not require staking to stand upright other than staking to control damage from strong winds or local conditions.
- Staking should then be as detailed on the drawings and provide free movement with support only to protect from excessive movement.

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
SPECIFICATION

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2/NTS.CC

DRAWN: AN/ GF
DATE: 6/11/24
SCALE: @A3
JOB NUMBER: 15237.5
PHASE: CC
DWG No: L802
REV: 2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

11.6 Trees

Trees specified for supply and planting on site must be in accordance with which have been grown to conform with AS 2303–2018 tree Stock for Landscape Use. The following specifications are provided as a summary and NOT the full standard to be met.

11.6.1 Interpretations

Calliper: Stem diameter measured at 300mm above ground.
Size index: Product of height (m) x calliper (mm)
Small trees: Trees grown in containers < 20 L (other than tube stock), and balled and bur lapped or RCB grown trees of size index < 35

11.6.2 Trees Inspection – HOLD POINT See schedules.

Timing: Three days prior to planting out.
Partial sampling: Expose a small section of the root ball, by washing, sufficient to permit inspection of root development from the stem to the outer extremity. After inspection, carefully replace soil.
Root systems: Root systems may be inspected using partial sampling at the following rates:

- ≤ 20 trees: 1 tree sampled
- 21 - 50 trees: 2 trees sampled
- ≥ 51 trees: 4%.

11.6.3 Compliance

General: Non-compliance may lead to rejection of the entire batch.
Substitution: If non-complying trees are proposed, submit proposal in writing to the contract administrator. Only written approvals of substitution are recognised. Submit a copy of the written approval of substitution with the non-complying trees.

11.7 Holding proposals

General: Submit proposals in writing to the contract administrator for proposed methods for holding trees and palms beyond specified dates so that trees will continue to comply should the project be delayed.

11.8 Shipment

Responsibility of the Landscape Contractor.

11.9 Above Ground Criteria

- **Comply with Tree Size Index Acceptable Range Table.**
- Type: Supply trees and palms which are true to type.
- Health: Supply trees and palms with foliage size, texture and colour consistent with that shown in healthy specimens of the species.
- Supply trees and palms with extension growth consistent with that shown in vigorous specimens of the species.
- Foliage: Restrict attach by pests and disease to < 10% of the foliage, such that potential for long term success of the trees and palms are not affected.
- Maximum variation in crown bulk on opposite sides of stem axis: + or - 20%. Uniformity of growth: Longest internode: Maximum 1.2 x shortest internode.
- Stem taper Supply trees which are self-supporting when not staked.
- Other than tube stock or small trees: Calliper measured 300mm above ground must be at least 1.2 x calliper at 1 m above ground level.
- Pruning history wounds: Confine fresh pruning wounds to < 25% of the clean stem height.
- Wound diameter: < 50% of stem diameter immediately above point of pruning.
- Pruning location: Clean cut at branch collar.
- Included bark. Bark ridge: Convex (outwardly pointing) at junctions between co-dominant stems, and stems and branches.
- Grafted varieties or cultivars. Union between scion and rootstock: Sound for perimeter of graft.
- Diameter of scion immediately above graft: Equal to diameter (+ or - 20%) of rootstock immediately below graft.
- Apical dominance. Apical bud: If appropriate for the species, supply trees which have a defined central leader and intact apical bud.
- Indication of north: Trees greater than 100 litre: Indicate northerly aspect in the nursery using a permanent peg embedded in the root ball 150mm north of the centre of the stem.

11.10 Below Ground

- Root systems: Fibrous with repeated and sequential division, complying with the Root Division Table.
- Root direction. Roots growing out or down: > 90% of roots within root ball at every stage of development.
- Root ball occupancy Test: Shake or handle unsupported root ball. Requirement for pass: > 90% of soil volume remains intact.
- Non-suckering rootstock
- Grafting: If appropriate for variety or cultivar, graft trees onto non-suckering root-stock.

11.10.1 Root Division Table

Tree Sizes		Root Division
Container Volume (L)	Size index (balled and burlapped or RCB grown trees)	
< 20	< 35	Major divisions at maximum 50 mm intervals.
≥ 20, < 100	≥ 35, < 130	Major division by 15 L container, or 250mm diameter x 300mm diameter deep root ball, at maximum 100mm intervals beyond this size..
≥ 100, < 200	≥ 130, < 230	Major division by 75 L container, or 450mm diameter or 450mm deep root ball, and at maximum 100mm intervals beyond this size.

11.11 Balance

Root ball: Shoot ratio (tubes tock and small trees)

- Tube stock height above soil level: 2 x height of the tube (+ or - 25%.)
- Small trees root ball (shoot ratio test): Hold stem at 80% of height above ground, deflect 30° from vertical, side to side. Requirement for pass: Container or root ball remains flat on the ground.

11.12 TREE SIZE INDEX – ACCEPTABLE RANGE [AS 2303-2018]

Where size index = height(m) x calliper(mm) (measured at 300agl)

Container Volume [L]	5th percentile	Acceptable Size Index Range			95th percentile
		25th percentile	50th percentile	75 percentile	
18	10	17	25	36	57
20	11	19	27	39	62
25	14	23	33	47	73
27	15	25	35	50	77
30	16	27	38	54	84
35	18	31	44	61	94
45	20	35	49	68	104
50	23	38	54	75	114
52	25	42	59	82	124
65	26	44	61	84	127
75	31	53	74	100	151
90	35	60	84	113	168
100	42	71	98	130	193
150	46	77	107	142	209
200	65	111	151	196	284
250	84	142	193	247	354
300	102	173	233	295	419
350	119	203	272	341	481
400	136	233	310	385	541
500	˜563	262	347	429	598
600	186	318	420	512	709
700	218	373	490	593	814
750	250	428	559	670	915
800	265	454	592	708	964
1000	281	481	626	746	1012
1200	341	585	756	891	1199
1500	400	686	883	1031	1377
1800	487	835	1067	1232	1631
2000	571	980	1246	1425	1872
2500	626	1075	1363	1550	2028
3000	761	4308	1647	1852	2402

11.13 Weed eradication

Herbicide: Eradicate weeds using environmentally acceptable methods, such as a non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.
Removal: Regularly remove, by hand, rubbish and weed growth throughout grassed, planted and mulched areas. Remove weed growth from an area 750 mm diameter around the base of the trees in grassed areas. Continue eradication throughout the course of the works and during the planting establishment period.

11.14 Vegetative spoil

Disposal: Remove vegetative spoil from site. Do not burn.

11.15 Individual plantings

Method: Excavate a hole to twice the diameter of the root ball and at least 100 mm deeper than the root ball. Break up the base of the hole to a further depth of 100 mm, and loosen compacted sides of the hole to prevent confinement of root growth.

11.15.1 Locations

General: If it appears necessary to vary plant locations and spacings to avoid service lines, or to cover the area uniformly, or for other reasons, give notice.

11.16 Planting conditions

Weather: Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain. In other than sandy soils, suspend excavation when the soil is wet, or during frost periods.

11.17 Watering

Timing: Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress.

11.18 Placing

Method: Remove the plant from the container with minimum disturbance to the root ball. Root prune to ensure all circling roots have been either severed or aligned radially into the surrounding soil. Ensure that the root ball is moist and place it in its final position, in the centre of the hole and plumb, and with the top soil level of the plant root ball level with the finished surface of the surrounding soil. Compact lightly so as to minimise subsidence without compacting the backfill. Avoid mixing mulch with topsoil.

11.19 Fertilising

Pellets: In planting beds and individual plantings, place fertiliser pellets around the plants at the time of planting.

11.20 Backfilling

General: Backfill with topsoil mixture. Lightly tamp and water to eliminate air pockets. Ensure that topsoil is not placed over the top of the root ball, so that the plant stem remains the same height above ground as it was in the container.

11.21 Hold Points – See Appendix Schedule table

Hold points (HP) require inspection by Terras Landscape Architects in order to complete final signoff. Written approval is required to proceed.
Witness Points [WP]
Photographic evidence of each WP shall be submitted to Terras Landscape Architects. Witness points (WP) require written approval to proceed but may not be inspected on site.

11.22 Mulching

Must be weed free and as per the scheduled material.
Mulch Condition The mulch does not contain asbestos, engineered wood products, asbestos, preservative treated or coated wood residues, or physical contaminants, including but not limited to glass, metal, rigid plastics, flexible plastics, or polystyrene. Provide a certificate of compliance upon request.

11.22.1 Placing mulch

General: Place mulch to the required depth, clear of plant stems, and rake to an even surface flush with the surrounding finished levels. Spread and roll mulch so that after settling, or after rolling, it is smooth and evenly graded between design surface levels sloped towards the base of plant stems in plantation beds, and not closer to the stem than 50 mm.
In mass planted areas: Place after the preparation of the planting bed but before planting and other work.
Extent: To extent of mass planting area and tree in turf.

11.23 Spraying

Product: Where required, spray with insecticide, fungicide or both.

11.23.1 Installation:

Dig small (300 x 300mm) trench to top of slopes / batters to be covered and lay sufficient length (300mm nominal) at end of jute matting roll into trench. Pin along width (500mm spacing or to manufacturer's recommendation) to bottom of trench and re-cover with excavated material and lightly compact using foot-pressure only.

Carefully unroll the jute matting down the slope. The jute matting should be pinned using 3 U-shaped pins to be placed on the right end, centre, and left the end of the fabric. Use minimum 3 pins per square meter to ensure that the fabric remains fully in contact with the ground.

Ensure overlaps of rolls minimum 100mm and pin into place. Wrap coir log at base with end of roll and pin/stake securely above and below coir log. Once installation is complete, spray the jute matting with water to conform it to land surface. Double-check pins and mat stability.

Make slits for planting as small as possible and ensure fertiliser mixture to bottom of each planting hole before plants installed.

11.24 Stakes and ties

11.24.1 Stakes

Staking shall only occur for advanced trees over 1500mm height.
Material: Hardwood, straight, free from knots or twists, pointed at one end.
Installation: Drive stakes into the ground at least one third of their length, avoiding damage to the root system.

11.24.2 Stake sizes:

- For plants ≥ 2.5 m high: Three 50 x 50 x 2400 mm stakes per plant.
- For plants 1.5 m – 2.5 m high: Two 50 x 50 x 1800 mm stakes per plant.

11.24.3 Ties

General: Provide ties fixed securely to the stakes, one tie at half the height of the main stem, others as necessary to stabilise the plant. Attach ties loosely to allow some movement but prevent storm damage. Ties shall be applied only to plants taller than 1.7m.
Tie types:

- For plants ≥ 2.5 m high: Two strands of 2.5 mm galvanized wire neatly twisted together, passed through reinforced rubber or plastic hose, and installed around stake and stem in a figure of eight pattern.
- For plants < 2.5 m high: 50 mm hessian webbing stapled to the stake or as detailed.

11.25 Completion

11.25.1 Product certification

Certification: Submit the supplier's written statement certifying that plants are true to the required species and type and free from diseases, pests and weeds.

11.26 Cleaning

Stakes and ties: Remove those no longer required at the end of the planting establishment period.
Temporary fences: Remove temporary protective fences at the end of the planting establishment period.

12. LANDSCAPE EDGING

12.1 Edging types

Standard
To AS 1379 Grade N32

12.1.1 Edging - steel

Standard To AS 1163, AS1554, AS4100, and ACSE Structural steel specification – Grade 250.

Installation: Steel edge shall be laid to accurate curved or straight lines to be approved on site. Deviation from straight line both vertically and horizontally shall not exceed 5mm when measured with a 3m straight edge. Curves must be continuous and free of bumps or corners. Edging welded to galvanised steel rods to be hot dip galvanised as shown on the drawings.

All fillet welds shall be full and continuous in accordance with AS 1554 part 1 and 2 as appropriate. Check and verify all dimensions prior to commencing fabrication.
Unless specified otherwise all fabrication tolerances shall be within 5mm and all angular tolerances shall be 5mm. Remove all burrs, sharp edges and corners prior to installation.

13. CONCRETE PAVEMENT

13.1 General

Consulting engineers' drawings and specifications shall take precedence over these specifications where separate civil structural documentation is provided for the project.
Provide finished surfaces as documented and as follows:

- Free draining and evenly graded between level points
- Even and smooth transitions

13.1.1 Performance & Design

Conformance: Comply with the engineer's design and detail.

13.1.2 Standards

Specification and supply: To AS 1379.
Materials and construction: To AS 3600.

13.1.3 Inspection

Inspection: Give notice so that inspection may be made of the following:

- Base or subgrade before covering.
- Concrete formwork, reinforcement and dowels in position.
- Commencement of concrete placing.
- Evaluation of surface finish.

13.1.4 Tolerances

- Edges abutting adjoining surfaces: Within ± 5 mm of the level of the actual gutter edge.

Rigid pavement surface:

- Absolute tolerance: + 10 mm, - 0 mm.
- Relative tolerance: ± 5 mm.
- Joint locations in plan (rigid pavement): ± 15 mm.

13.1.5 Submissions

Compliance certificate: As an alternative to testing a product, submit the manufacturer's certificate together with the results of recent tests undertaken by the manufacturer, showing compliance with test criteria.
Aggregates: Nominate the source for all aggregates proposed.
Repair materials: Submit proposals for epoxy resin/grout and elastomeric sealant.

13.1.6 Execution

Work method statements: Submit proposals for the methods and equipment to be used for the pavement works, including the following:

- Staging of the work, access and traffic control methods.
- Disposal of surface water, control of erosion, contamination and sedimentation of the site, surrounding areas and drainage systems.
- Mix design variation: If a variation is proposed, submit a further mix design report.
- Damaged galvanizing: If repair is required, submit proposals to AS/NZS 4680 Section 8.
- Joint sealants: Submit proposals for installation methods and sealant performance.
- Concrete placing: Submit proposals for size of the area to be placed and the spacing of planned construction joints before placement commences.
- Crack assessment: If unplanned cracks occur in the finished pavement, submit proposals for investigation.
- Surface repair method: If required, submit details of the proposed method before commencing repairs. Trial section: Submit trial pavement.

13.1.7 Reinforcement

- General
- Steel reinforcement: Steel bars or mesh to AS/NZS 4671.

Surface condition: Free of loose mill scale, rust, oil, grease, mud or other material which would reduce the bond between the reinforcement and concrete.

13.1.8 Protective coatings

Protective coating: Coatings to reinforcement must not reduce the performance of the reinforcement. Do not galvanize reinforcement steel unless specified by the engineer. For pavements containing protective coated reinforcement, provide the same coating type to all reinforcement and embedded ferrous metal items, including tie wires, stools, spacers, stirrups, plates and ferrules.

13.1.9 Dowels

General: Provide each dowel in one piece, straight, cut accurately to length with ends square and free from burrs. Standard: To AS/NZS 4671.Grade: 250R steel bars 450 mm long.

13.1.10 Aggregate

Standards: AS 2758.1.
Quality: Provide at least 40% by mass of the total aggregates in the concrete mix of quartz sand aggregate having a nominal size of less than 5 mm and containing at least 70% quartz by mass.
Durability: All constituent, fraction of constituent or aggregates to conform to AS 1141.22 and the following:

13.1.11 Cement

Standard: To AS 3972.

13.1.12 Fly ash

Standard: Fine grade fly ash to AS 3582.1.
Minimum binder content (fly ash plus cement): 300 to 330 kg/m3.

13.2 Execution

13.2.1 Subgrade

Conformance: Prepare subgrade in conformance with the Earthwork work section.
Extent: Prepare a uniform subgrade for the full pavement formation, extending at least to the back of kerbs. Reinstatement: Ensure uniformity for backfilling of any utility trenches.
Subbase thickness: To engineer's drawings

13.2.2 Concrete mix

Concrete mix and supply: To AS 3600 Section 17 and AS 1379.

13.2.3 Properties

Concrete pavement thickness: To engineer's drawings
Concrete pavement strength: To engineer's drawings

13.2.4 Testing

Sampling, identification, testing and recording: To AS 1012.
Slump: Test at least one sample from each batch before placing concrete from that batch in the work.

- Standard: To AS 1012.

13.3 Project Installation

13.3.1 Junctions with existing pavements

Trimming: Where the pavement is to be joined to an existing pavement remove a strip of the existing pavement at least 300 mm wide for its full depth and trim the edge vertically before placing new pavement material.
Existing sealed pavement: Trim the seal to a neat edge.

13.3.2 Fixed formwork

Description:

- Steel forms.
- Seasoned, dressed timber planks, free of warps, bends or kinks, with the full width of their top edges covered with steel angle sections finishing flush with the form face.

Depth: Equal to the edge thickness of the slab and in one piece.
Tolerances on position:

- Absolute level tolerance: ± 5 mm.
- Relative level tolerance: ± 5 mm.
- Horizontal tolerance: ± 10 mm (maximum departure of face from a plane surface).
- Verticality: 3 mm departure from vertical.

Staking: Stake forms in position using at least 3 steel stakes per form, not more than 1.5 m apart.
Lock joints between form sections to prevent movement.
Re-use: Clean and recoat the forms each time before placing concrete.
Keyways: Form the keyways of keyed construction joints using steel form strips accurately located at the mid-depth of the slab and securely fastened flush against the formwork face.

13.3.3 Reinforcement

Tolerances in fabrication and fixing: To AS 3600.
Locate reinforcement: Place reinforcement in the top half of the pavement.
Minimum cover to reinforcement: 30 mm.

13.4 Concrete Placing and Compaction

13.4.1 Concrete placing

General: Place concrete uniformly over the width of the slab or lane and so that the face is generally vertical and normal to the direction of placing. Hand spread concrete using shovels, not rakes.
Remove: Any water ponding on the ground.
Placing sequence: Commence from one corner (usually the lowest point) and proceed continuously out from that point.
Weather: Do not place concrete in temperatures above 30°C or below 10°C without adequate precautions.

13.4.2 Rain

General: During placement and before setting, do not expose concrete to rain.
Protection: Protect surface from damage by covering until hardened.

13.4.3 Concrete placing in hot weather

Handling: Prevent premature stiffening of the fresh mix and reduce water absorption and evaporation losses. Mix, transport, place and compact the concrete in conformance with the Hot weather placing table.
Formwork and reinforcement: Before and during placing maintain temperature at 35°C.
Severe weather: If ambient shade temperature more than 38°C, do not mix concrete.

13.4.4 Concrete Primary Finish

Finishing: Do not commence finishing until all bleed water has evaporated from the surface.
Commence: Immediately after placement and spreading and compaction of the plastic concrete, start finishing operations to achieve the documented finish.
Finish: exposed aggregate

13.4.5 Concrete curing

Curing: Commence curing as soon as possible after finishing and extend for a minimum period of 3 days.
End of curing period: Prevent rapid drying out at the end of the curing period.
Protection: Maintain at a reasonably constant temperature with minimum moisture loss, during the curing period.

13.4.6 Hot weather curing

Curing compounds: If it is proposed to use curing compounds, provide details.
Protection: Select a protection method as applicable.

13.5 Joints

General: Construct expansion, contraction and construction joints straight and plumb. Make transverse joints normal to longitudinal joints. Extend transverse expansion and contraction joints continuously from edge to edge of the pavement through interconnected slabs.
Joint layout: Install joints as documented.
Installation: Construct transverse and longitudinal contraction joints by early age power sawing or by placing an insert in the fresh concrete.

13.5.1 Dowelled joints

Dowelled contraction joint: Place dowels at 300 mm centres orthogonal to the joint direction and parallel to the pavement surface, accurate alignment is critical, ensure proper field supervision.
Dowel assembly: Use a dowel-assembly support frame firmly secured to the subbase during concrete placement. Prevent the dowel assembly support frame from passing through the joint. Do not insert dowels during the placement of concrete.
Debond dowel: Coat with a debonding coating to 0.5 length + 25 mm. Embed the unpainted half of the dowels in the slab placed first.
Movement: Do not distort or displace beyond the alignment tolerances under testing or during construction. Do not remove and replace dowels in pre-formed holes.

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
SPECIFICATION

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS. LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2 /XREFS.CC

DRAWN: AN/ GF | DATE: 6/11/24 | SCALE: @A3

JOB NUMBER: 15237.5 | PHASE: CC | DWG No: L803 | REV: 2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

13.5.2 Tie bar joints
Longitudinal contraction joints: Place tie bars at 800 mm centres. Alignment accuracy of tie bars is not critical.

13.5.3 Construction joints
Installation: Place header board on the subbase or subgrade at right angles to the pavement centre line.
Planned location: Terminate each day's placing operation at a transverse construction joint located to coincide with a planned contraction or expansion joint.
Unplanned joints: If placement is interrupted for 30 minutes or longer, form a tied transverse construction joint within the middle third of the distance between planned joints but no closer than 1.5 m to the nearest planned joint. If necessary, remove placed concrete back to the required location.

13.5.4 Expansion joints
Expansion joints: Provide formed full depth joints around structures and features which project through, into or against the pavement, and elsewhere as required.
Doweled expansion joints: Cap dowels at one end with a compressible material.

13.5.5 Formed joints
Full depth joints: Form the edge of the concrete placed first to provide a smooth, vertical face.

After stripping and cleaning fix the joint filler with a suitable waterproof adhesive to the face of the slab, and place the adjoining concrete after the adhesive has set.
Weakened plane joint: Cut a crack-inducing groove by using a suitable tool into the plastic concrete during finishing of the concrete surface. Compact and refinish the plastic concrete around the groove after forming the joint.

Rebated groove joints: Form the rebate by securely fixing removable steel or timber form strips to the form or forms on the slab which is placed first, so that the top of the steel strip is flush with the top of the form. After stripping fix the joint filler in the rebate after placing the adjoining concrete.

13.5.6 Sawn joints
Weakened plane joint: Saw the hardened concrete to depth at least ¼ to ⅓ of the pavement thickness and to a uniform width in the range of 3 – 5 mm as follows:
- Timing: Commence sawing, regardless of time or weather conditions, as soon as the concrete has hardened sufficiently to permit cutting with only minor ravelling of the edges of the saw cut. Complete sawing no later than 24 hours after concrete placement.
- Sequence: If possible, saw every third transverse joint initially, then saw the intermediate joints. Start where concrete placement has commenced.
- Cracking: If the concrete has already cracked near the location chosen for a joint, do not saw a joint in that location. If a crack develops ahead of the saw cut, discontinue sawing and submit proposals for extra sawn joints. If uncontrolled cracking occurs, suspend concrete placing.
- Stand-by machines: Provide one stand-by sawing machine for each machine planned to be used.
- Cleaning and protection: Immediately after each joint is sawn, flush the saw cut and adjacent concrete surface using water, until the waste from sawing is removed from the joint. Temporarily caulk the joint using plastic or rubber tubing, or a suitable Tee shaped extrusion. Leave the caulking in place until grooving and sealing.
- Rebated groove joints: Saw straight, parallel sided grooves for joint seals on top of and centred on the sawn weakened plane joints.
- Timing: Commence sawing after the curing period has ended, immediately before joint sealing. Saw during daylight hours.

13.5.7 Joint sealing
Sealant type: Provide silicone sealant in conformance with manufacturer's recommendations.
Backing rod: Compressible closed cell polyethylene foam with a bond breaking surface.

13.6 Protection
General: Keep traffic, including construction plant, off the pavement entirely during curing, and thereafter permit access only to necessary construction plant vehicles that conform to the predetermined load limits appropriate to the use of the concrete.

13.6.1 Traffic on pavement
General: Give notice before opening the pavement to traffic before the work is completed. Provide protection.

13.7 Testing
Concrete pavement: Check tolerances. Where pavement does not conform submit rectification proposal.
Unplanned cracking:
- 0.3 mm wide crack is acceptable.
- > 1 mm must be assessed, submit a proposal for possible cause and rectification processes.

14. GRANULAR SURFACES

14.1 Materials

14.1.1 Base
Description: Fine crushed rock, free of sand and coatings of clay or organic material, and containing not more than 1% disintegrated, weathered, soft fractured, friable or poorly indurated fragments.

14.1.2 Granular surface material
Particle size: 5 mm to 20 mm with 40% 5 mm to 10 mm, and 60% 10 mm to 20 mm.
Stabilising: Screed out the fines and replace with 1-part off-white cement to 35 parts decomposed granite to slopes less than 1:30, and with 1 part off-white cement to 20 parts decomposed granite to slopes more than 1:30.

14.1.3 Thickness:
Spread blended dry mix screeded to 100 mm minimum over the compacted subgrade.
Compaction: To 90% of the maximum dry density when tested to AS 1289. Discard stones more than 25 mm.
Moisture:
Do not water in the surface material. Allow the natural ground water to rise and stabilise the mixture.

14.2 Subgrade

14.2.1 Preparation
Excavation: Cut and trim the subgrade to enable the finished compacted thickness to finish flush with adjacent surfaces.

14.2.2 Subgrade and base compaction
Hand compaction: Condition the material by moisture adjustment before compaction. Compact to 95% of the maximum dry density.
Sampling: To AS 1289.1.2.1. Testing: To AS 1289.5.1.1, AS 1289.5.3.1 or AS 1289.5.8.1.

14.2.3 Finished levels
Absolute level tolerance: ± 10 mm from the documented profile.

15. LANDSCAPE – ESTABLISHMENT

15.1 Definitions
Refer to specification section on Turf to see additional specification detail.
Plant establishment period: The period between the date of practical completion and the end of the defects liability period.

15.2 Inspection Notifications
- Inspection: Give seven days written notice so that inspection of the contract area may be made at the following:
- Date of practical completion.
- Date of final completion.

15.3 Log book
Records: Log the following on a weekly basis:
- Description, time and method of application of toxic material.
- Maintenance work details.
- Inclement weather to verify inability to carry out work within the specified time frame.

15.4 Replacement plants
Species: Provide written certification that all plant material is true to the required species and type.

15.5 Execution
Monthly report: Submit regular reports by the last Friday of each month:
- Of the general status of works.
- Include soil test results as required for the fertilising programs.
- Plant replacement requirements.
- Incident reports: Report immediately verbally and confirm in writing any disturbance or incidence affecting or likely to affect the day-to-day scheduling of works.

15.6 Planting works

15.6.1 Planting
Planting: Ensure the general appearance and presentation of the landscape and the quality of plant material at date of practical completion is maintained for the full planting establishment period.
Existing plant material: Maintain existing planting and grass within the landscape contract area as specified for the corresponding classifications of new grassland or planting.
Replacements: Replace failed, dead and/or damaged plants at maximum 3 week intervals as necessary throughout the full plant establishment period.

15.6.2 Pruning
Prune: To AS 4373
- Prune all branches that interfere with safety,
- Under prune all street trees and parking lot trees to maintain clear area underneath. Do not under prune more than 20% of canopy. Prune in correct seasons to avoid flower loss
- Prune back any ground cover or strappy leaf plants overhanging kerbs of sidewalks.
- Remove dead or diseased wood
- Once a year, prune all trees to encourage a high-branching structure. Remove all non-structural branches between the ground and a point maximum one third of the tree's total height (for very tall trees don't remove branches higher than 6 m above the ground).

15.6.3 Insect and disease control
Responsibility for insect and disease control: Contractor Period for treatment: Until the problem has been eliminated.
Chemical spray: Apply outside of normal working hours.

15.6.4 Stakes and ties
Generally: If plants are unable to be self-supported or if stakes are damaged, stake or re-stake the plants.
Removal: If plants are robust with well-developed systems and are strong enough to no longer require support, remove stakes and ties.

15.7 Grass

15.7.1 Mowing and trimming
Litter: Remove litter and fallen branches before mowing.
Height: Consistent with the growth habit of the grass variety and maintained at 25 mm to 40 mm throughout the year.
Program: Weekly during the mowing season, November to March, and at bi-weekly intervals during April to October. Do not mow under wet conditions.
Raking: Once every month before mowing, during the mowing season, with a flexible rake. On alternate mowings, adopt a north-south and east-west pattern.
Edges: At the same time as mowing, trim lawn edges to plant beds, pathways, base of trees and other obstacles. Ensure trees and shrubs are not damaged.
Clippings distribution: remove from site.

15.7.2 Topdressing
Topdressing material for established lawns: Weed free imported sandy topsoil to of 5mm deep.

Application times
At laying:
When required to fill holes and gaps.
Spring renovation: Topdress in last week November.
Top dressing material for remediation of depressions or irregularities: Apply coarse or medium soil to AS4419 suitable for application to turf or grass seeded areas.
Witness Point: Topdressing

15.8 Fertilising

15.8.1 Application Times - Turf:
Apply lawn fertiliser at the completion of the first and last mowings of the plant establishment period, and at other times as required to maintain healthy grass cover a minimal of 3 months from end of contract establishment period.
Witness Point: Advise the superintendent and provide photo dated photographic evidence to the superintendent of applications

15.8.2 Application Times – Trees + Turf:
Fertilising: Apply 6 month slow release fertiliser at the manufacturer's recommended rate at planting and then apply every 6 months during the plant establishment period.
Preferably fertilise shrubs and trees in September and March according to their seasonal growth requirement.
Witness Point: Advise the superintendent and provide photo dated photographic evidence to the superintendent of applications

15.9 Garden beds

15.9.1 Weeding
Weeds: Unwanted plants and grasses considered invasive to the locality.
Program:
- Lawns: Quarterly, and as determined by the relationship of the general lawn condition and weed growth.
- Trees and shrubs: As required for planted, paved and mulched areas to be weed free when observed at bi-weekly intervals.
- Method: Clear and keep clear vigorous ground covers 200 mm from the base of any shrub or tree:
- Small areas: By hand.
- Large areas: Proprietary herbicides.
- Herbicide application: Avoid windy days or if rain is likely to follow within 12 hours. Apply to the manufacturer's instructions and material data and safety sheets.
- When the weather is humid with moderate temperatures and maximum sunlight.
- When the ground has recommended soil moisture.

15.9.2 Rubbish removal
Remove loose rubbish such as bottles, papers, and cigarette butts from the site. Execute this work regularly so that all areas are free from rubbish, minimum fortnightly.
Leaf litter: Remove from all path and lawn areas and remove from site as directed.
Sweep or blow-off all walks, curbs, and gutters weekly and following all mowing and edging operations.

15.9.3 Mulched surfaces
Maintain a minimum depth of:
- 100 mm for organic mulch.
- Re-mulching: Maintain the original ground levels around the base of plants.
- Place mulch to the required depth, clear of plant stems, and rake to an even surface flush with the surrounding finished levels. Spread mulch so that after settling it is smooth and evenly graded between design surface levels sloped towards the base of plant stems in mass planted beds.
- Any mulch found outside mass planted areas shall be returned to the garden.

15.9.4 Watering trees
- Water trees immediately on arrival and at planting ensuring 50% or root ball minimum

Watering frequency advanced trees 45 litre+

Time Year	Watering Frequency		
	First Month	Second Third Month	After
Sept - Feb	3 x Week	2 x Week	1 x Week
Mar - May	2 x week	1 x week	1 x week
June - Aug	1 x week	1 x fortnight	

Watering volume advanced trees 45 litre+

Container Size	Application Rate	Duration	
45 Litre	7 Litres	6 months	
75 Litre	10 Litres	6 months	
100 Litre	10 Litres	6 months	
200 Litre	20 Litres	6 months	
400 Litre	40 Litres	6 months	

15.9.5 Hand watering
General: Manually water all lawn and planting areas, soaking to a depth of 150 mm for lawn and 300 mm for planting. Avoid frequent dampening of the surface. Allow the surface of the soil to partially dry out between waterings.

15.10 Plant establishment compliance table

Plant material	Acceptable failure per area	Acceptable concentration of failure
Tube stock	< 10%	< 15% in any given location
140 mm	< 5%	< 15% in any given location
300 mm or larger	< Nil%	Nil %
Turf	< 5%	Nil %
Cells	< 5%	< 15% in any given location
Direct seeded native species and cover crop – including hydromulch, drilled and broadcasted areas	No less than 3 [Nominate as appropriate] specified species per 1 m2 grid (determined on a testing frequency of 20 grid areas per 500 m2)	Nil grids with < three (3) [Nominate as appropriate] specified plant species
Direct seeded grass species and cover crop	< 15% (determined by a 1 m2 grid on a testing frequency of 1 grid area per 500 m2)	< 10%
Cover crop	< 5%	Nil %

15.11 Paving and structures

15.11.1 Paving
General: Inspect and clean all paved surfaces and ensure they are free from obstacles and plant litter. so that all pavements are cleared when observed at fortnightly intervals.

15.12 Furniture
Maintenance guidelines:
- Furniture: Keep in a good condition and move as required to carry out maintenance

15.12.1 Compliance
- Plant establishment shall be deemed complete, subject to the following:
- Repairs to planting media completed.
- Ground surfaces are covered with the specified treatment to the specified depths.
- Pests, disease, or nutrient deficiencies or toxicities are not evident.
- Mulched surfaces have been maintained in a weed free and tidy condition and to the specified depth.
- Vegetation is established and well formed.
- Vegetation cover to cell, seeded and/or hydro mulched areas to the Plant establishment compliance table.
- Plants have healthy root systems that have penetrated into the surrounding, undisturbed ground and not able to be lifted out of its planting hole.
- Specified vegetation setbacks from services and furniture are evident.
- All hard landscape works have been installed and are operating as specified.
- Collection and removal of litter.
- Removal of mulch from drainage and access areas.
- All non-conformance reports and defects notifications have been closed out.

15.13 Landscape – Furniture and Fixtures

15.14 Notice
Inspection: Give notice so that inspection may be made of the following:
- Custom-built fixtures fabricated and ready to be delivered to the site.
- Furniture items delivered to site before installation.
- Site locations or substrates prepared to receive furniture or fixtures before installation.

15.15 Fixing
Line and level: Erect posts or poles vertically. Erect furniture items level, pack as required

15.16 Completion

15.16.1 Maintenance manual
Submit the manufacturers' data as follows:
- Recommendations for service use, care and maintenance.

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
SPECIFICATION

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2/XP25.CC

DRAWN: AN/ GF | DATE: 6/11/24 | SCALE: @A3

JOB NUMBER: 15237.5 | PHASE: CC | DWG No: L804 | REV: 2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

TECHNICAL SCHEDULES

1. SCHEDULE
GENERAL - MATERIALS AND FINISHES

ALLOW FOR SUPPLY AND INSTALL FOR ALL ITEMS AS SCHEDULED BELOW.
NOTE: Use proprietary items as specified below. Similar item equal in workmanship, materials and design may be approved subject to the written approval of Terras Landscape Architects.
Ensure early ordering items to avoid delay in delivery.
Refer to written technical specification for additional standards and installation, performance criteria not included in these schedules.

SCH 1. [PV01] PLAIN CONCRETE

Location	See Dwgs for locations
Supplier	Boral – Envirocrete Range https://www.boral.com.au/product-data-sheet/boral-lcc-product-range-2024 Holcom – Eco Pact Range https://www.holcim.com.au/sites/australia/files/docs/ecopactportfoliobrochure.pdf
Finish	Finish: Broom finish across path.
Quantity - Area	Refer to Dwgs

SCH 2. [PV02] COLOURED CONCRETE

Location	See Dwgs for locations
Supplier	Concrete Colour Systems https://concretecoloursystems.com.au/
Type	Full Depth Colour Concrete
Finish	Colour: CCS "Blue Gum" 3% in grey cement Finish: Broom finish across path.
Quantity - Area	Refer to Dwgs

SCH 3. [PV03] COLOURED CONCRETE

Location	See Dwgs for locations
Supplier	Concrete Colour Systems https://concretecoloursystems.com.au/
Type	Full Depth Colour Concrete
Finish	Colour: CCS "Driftwood" 4% in grey cement Finish: Broom finish across path.
Quantity - Area	Refer to Dwgs

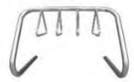
SCH 4. [PV04] DECO GRAVEL

Location	See Dwgs for locations
Supplier	Australian Native Landscapes https://anlscape.com.au
Edge	See drawing details
Finish	**Deco©-Granite** - Brown Gravel
Quantity - Area	See drawings for areas

[M01] ORGANIC MULCH

Location	Mass planting beds – Trees in turf
Supplier	Australian Native Landscapes https://anlscape.com.au/
Type	Eucy Mulch
Depth	100mm depth to 'Mulch Only' areas – refer plan 75mm depth to all mass planting areas.

SCH 5. {BR01] BICYCLE RACK

Location	See drawings for locations.
Supplier	https://tactilesystems.com.au/
Type	5 bay surface mount bicycle rack
Code	BR-5B-S
Material	Stainless Steel
Fixing	Select Subsurface or surface fixing
Colour + Finish	Stainless Steel
Quantity - Area	Refer Plans
Size	1220L x 850W x 850H (mm)
	

SCH 6. [R2] TIMBER SLEEPER RETAINING WALL

Location	See Dwgs for location (R2)
Supplier	Landscape Contractor to determine
Fixing	To adjoin existing retaining wall. To civil engineers detail.
Colour + Finish	200 x 50mm x (various length) H4 Treated Pine Sleepers.
Qty	Enough timber for 25m linear meters x 600h retaining wall
Notes	Deadman Anchor wall installation to match existing on site, as shown. Wall is to adjoin existing timber sleeper retaining wall. Construct to civil documentation.

SCH 7. [F01] FURNITURE – PARK SEAT

Location	See Dwgs for location
Supplier	Street and garden https://streetandgarden.com/
Type & Code	TB
QTY	3
Fixing	Surface
Colour + Finish	Body - Glass Reinforced Concrete (Lightweight Concrete) Body - CCS Colour Oxide Honeycomb 4%
Size	TWIG2 - L2370 x W1930 x H825mm - 350kg GRC
colour	

SCH 8. STAKES AND TIES

Location	All trees 45 Litre and above.
Description	Stakes for tree planting
Installation	Separate toes for each stake. Do not use 'Figure 8' method.
Type	**<45 Litre tree:** 2 x 35mm hardwood stakes. 1800 long Hessian ties fix at 1.0m afgl **45-400 Litre tree:** 3 x 50mm hardwood stakes. 2400 long Hessian ties fix at 1.5m afgl

SCH 9. [SE01] GARDEN EDGING GALV STEEL

Location	Interface of turf and mass planting Trees in turf where detailed Other locations where detailed on the drawings and details
Type	Formboss' 'Galvabond' FBG20150 incl connectors and custom stakes. Install edging height afgl as detailed otherwise flush with adjoining surfaces
Size	150 x 2.0
Fixing	Finish top flush with adjoining turf or mass planting unless otherwise detailed on the drawings Fix with 50x50 hardwood stakes screwed to edging.

SCH 10. [CR1, CR2] RAISED BEDS

Location	Locations where detailed on the landscape plan
Supplier	ANL LANDSCAPE https://www.australianlandscapesupplies.com.au/
Type	**Flex Raised Garden Bed - Weathered Steel**
QTY, Size	1 x CR1 560H x 2160 lengths x 5 qty = 1.7m radius / oval bed
	1 x CR2 560H x 2160 lengths x 4 qty = 1.3 – 1.4m radius / oval raised bed

SCH 11. INDIGENOUS CLAN TOTEM POLES

Location	Located at each Clan station / nominated on plan
Supplier	 https://norwoodproducts.com.au/ or similar local manufacturer
Type	Minimum 3m tall x 150mm smooth round diameter totem pole for clan customisation with indigenous artists.
QTY	13 = 1 -2 x per indigenous clan (TBD)
Notes	**To be confirmed/ pending final design.** **Requiring Indigenous engagement and Community input into the placement of the artwork and the information in and around the 13 totems in a workshop environment.** **Image indicative****

SCH 12. INDIGENOUS CLAN STORY PLINTHS

Location	Located at each Clan station / nominated on plan
Supplier	https://norwoodproducts.com.au/ or similar local manufacturer
Type	Hardwood Plinth with splay top, acrylic panelling adhered to approx. 400 x 600mm splay top, displaying clan story.
Size	Hardwood log minimum 400L x 400W x 600H
QTY	13 = 1 x per indigenous clan
Notes	**To be confirmed/ pending final design. Requiring Indigenous engagement for final design confirmation.**

SCH 13. EXCAVATION SCHEDULE

Location	**Depth** [mm]	**Notes**
Mass planting	400mm	Cultivate base, depth to allows for 300mm soil and 75mm mulch.
Turf	100mm	Prior to soil underlay spreading.
Trees	Depth root ball	See drawing details

200mm

SCH 14. CULTIVATION SCHEDULE

Location	**Depth** [mm]	**Notes**
Subgrade Turf + mass planting	100	All excavated beds and areas for turf. **Witness Point** before filling.

SCH 15. SOIL TYPE

Location	**Depth [mm]**	**Type**
Refer to specification section for soil 'type' requirements based on SESL mix type criteria as listed in the specification		
Turf	100	C1
Mass Planting Beds	300	D2
Trees	Top 300	D2
Trees	Below top 300	D4

SCH 16. CONCRETE FINISHES

Material	**Finish Type**	**Notes**
Concrete	Broomed finish for PV02, PV03	Provide surfaces broomed to an even texture by a stiff, even broom, in uniform direction; edges (including to joints) then tooled to a uniform narrow margin and fine radius then broomed over

SCH 17. FERTILISER ADDITIVE

Location	**Type**	**NPK Ratio**
Mass planting	Soils additives to meet test result amelioration requirements	
Mass planting [At Planting]	Water crystal wetting agent and fertiliser mix equal to Terraform	Terraform mix
Mass planting [Maintenance Period]	6 Month slow release	NPK 19.3.9
Turf at laying	Turf starter	NPK 20.12.4
Turf establishment	Organic lawn fertiliser	NPK 10.4.5
Trees	Water crystal wetting agent and fertiliser mix equal to Terraform	Terraform mix

SCH 18. [SSD] SUBSOIL DRAINAGE

Location	Locations where detailed on the drawings and details. Minimum to be installed to all mass planting beds and street trees. Connect to stormwater system or discharge appropriately.
Type	Perforated plastic pipe, geotextile wrapped to AS 2439.1
Size	90MM Diameter
Backfill	20mm nominal size aggregate.
Filter fabric	Polymeric fabric formed from plastic yarn containing stabilisers to make the fabric resistant to UV light.

REV	DATE	COMMENTS
2	11/7/25	GENERAL UPDATE
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
SCHEDULES

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2.VWX25.CC

DRAWN: AN/ GF
DATE: 6/11/24
SCALE: @A3

JOB NUMBER: 15237.5
PHASE: CC
DWG No: L901
REV: 2

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

2. SCHEDULE HOLD POINTS

HOLD POINT A Hold point is a mandatory verification point beyond which a work process cannot proceed without authorisation by the superintendent.

WITNESS POINT A Witness point is an identified point in the work process where the contractor is required to notify the project superintendent who may may review, witness, inspect or undertake tests on any component, method or process of works. The superintendent may or may not take the opportunity.

HOLD POINT DESCRIPTION	REQUIRED APPROVAL
NOTIFY THE LANDSCAPE SUPERINTENDENT AT THE FOLLOWING HOLD POINTS AWAIT APPROVAL BEFORE PROCEEDING FURTHER.	
Setout	Excavation and set out of proposed works. Allow for each stage of each work type, concrete, paving, fencing
Mass planting bed excavation	Excavated to depth, superintendent approval required before soil backfill. Subsoil drain installed.
Soil test results	Test results and any amelioration before placing soil on site.
Plant stock general	Plants in pots on site prior to planting.
Trees prior to planting	Trees on site prior to planting. NATSPEC certificates to be provided. All trees must conform to NATSPPEC. Refer to the tree compliance table in the specification.
Rubber softfall	Sub base prepared and drainage installed. Certification from rubber installer verifying acceptance of substrate.
Turf underlay soil	Spread and graded even and to depth prior to turfing.
Concrete paver samples	Sample panel for inspection where request.
Plant establishment period completion	Hold point for inspection before end of maintenance establishment period.
Furniture on site	On site prior to installation.
Warrant Documents + Manuals	Prior to operational acceptance

3. SCHEDULE WITNESS POINTS

WITNESS POINT DESCRIPTION	REQUIRED APPROVAL
NOTIFY THE LANDSCAPE SUPERINTENDENT AT THE FOLLOWING WITNESS POINTS AND PROVIDE PHOTOGRPHIC EVIDENCE.	
Tree Protection	Protective fencing set out.
Cultivation	Planting areas.
Fertiliser application	Tree turf and mass planting areas.
Top dressing	Ongoing maintenance top dressing MUST be done at least twice, once at laying, once during maintenance period is more than 13 weeks.
Plant stock general	Plants in pots on site prior to planting.
Trees	Commencement of planting.
Irrigation	Design drawings and specification of fittings proposed.
Soft Fall Attenuation Testing – Play Areas	Provide test results for fall zones in playground area as per standard to verify attenuation layer compliance.

4. SCHEDULE DEFECTS + PLANT ESTABLISHMENT

TYPE	PERIOD	NOTES
Soft landscape Establishment	**26 weeks**	From date of written acceptance of practical completion
53 x Trees Establishment and Maintenance	**5 years**	From date of written acceptance of practical completion
Hard works defects	**52 weeks**	From date of written acceptance of practical completion

5. SCHEDULE MAINTENANCE WORKS SOFT LANDSCAPE

Tickbox	Maintenance Activity
Refer to the technical specification clauses for landscape planting for additional detail on maintenance activities required. The below list is a performance checklist of items.	
☐	Check turf and garden areas for vehicular damage. If required, lift turf and backfill with topsoil to form an even grade and reinstate turf.
☐	Mow and edge turf to 50mm mow height. Turf must not exceed 80mm height at any time. Remove visible lawn clippings and debris from turf.
☐	Prune back any groundcovers / shrubs overhanging kerbs, footpaths or other planting. [Also see pruning in specification]
☐	Remove any broken or fallen branches from trees or access ways.
☐	Prune street trees - Only under prune street trees as they mature to ensure the lower branches clear the top rail of tree guard. Do not prune in excess of 1:3 canopy trunk ratio. Remove sucker growth from trees.
☐	Remove any weeds larger than 50mm high or wide from garden beds. Weeds 50mm and larger must be removed, not poisoned. There shall be no greater than 5% weed coverage in garden beds.
☐	Check plants for signs of stress or disease. Replace any plants that meet conditions for replacement at the contractor's expense. Request authorisation to replace other dead or missing plants. Note: Contractor must request authorisation to make replacements within one week of the damage becomming evident.
☐	Treat all plants, trees and turf for signs of disease or pest infestation. Turf shall be maintained in a healthy, vigorous condition, free from weeds, diseases and pests.
☐	Ensure that all plants and turf areas receive adequate water to sustain healthy growth. Weekly watering not sufficent in extreme conditions and frequency will need to be adjusted to satisfy this requirement.
☐	Sweep or blow clean all walkways, kerbs and gutters within scope of works. Remove pruning debris, mowing waste and rubbish off site on day or works being undertaken.
☐	Replace damaged turf. Lift and top-dress subsided turf to prevent trip hazards, especially at interface with hard surfaces.
☐	Inspect tree guards for damage and repair as required.
☐	Remove accumulated soil and / or mulch from timber edging and locally regrade to match existing turf and garden bed levels. Top up soil and mulch to garden beds that are finishedflush with adjoining turf or concrete surfaces.
☐	Repair any hard landscaping such as timber edging etc
☐	Apply fertiliser to all mass planting and turf as specified in early Spring and late Winter or progressively for 6 months slow release. Submit receipts to Principal's authorised representative as proof of fertiliser purchase.

PLANT SCHEDULES

PLANT SCHEDULE -FORAGING FOREST TREES

ID	Botanical Name	Common Name	Height	Width	Pot Size	QTY
ArCu	Archontophoenix cunninghamiana	Bangalow Palm	10-15m	10-15m	45ltr	9
CyCo	Cyathea cooperi	Coin Spotted Tree Fern	3.5 - 6m	3.5 - 6m	45ltr	7
GrBe	Grevillea baileyana	White Oak/Bailey's Silky Oak	8 - 15m	5 - 10m	45ltr	1
TrLa	Tristaniopsis laurina	Kanooka, Water Gum	5 - 10m	3.5 - 6m	45Ltr	3

2 REVISED TREE QUANTITIES

PADDOCK TREES

ID	Botanical Name	Common Name	Height	Width	Pot Size	min. Spacing	QTY
CaSe	Callicoma serratifolia	Black Wattle	Height	Spread	25Ltr	2m centres	19
FlAu	Flindersia australis	Crows Ash	Height	Spread	45Ltr	5m centres	10
LoCo	Lophostemon confertus	Brushbox	Height	Spread	45Ltr	5m centres	4

2 REVISED TREE QUANTITIES

PLANT SCHEDULE - SHRUBS/MIXED PLANTING AS PER LANDSCAPE PLAN

ID	Botanical Name	Common Name	Height	Width	Pot Size	QTY
PoLa	Poa labillardieri	Tussock Grass	0.75 - 0.9m	0.6 - 0.9m	200mm	20
RaOP	Rhaphiolepis indica 'Oriental Pearl'	Indian Hawthorn	0.9 - 1.2m	0.9 - 1.2m	200mm	130
PleArg	Plectranthus argentatus	silver spurflower	0.75 - 0.9m	0.9 - 1.2m	200mm	65
AlDe	Alternanthera dentata	Little Ruby	0.3 - 0.45m	0.3 - 0.6m	200mm	268
LiMu	Liriope muscari 'Evergreen Giant'	Lily Turf 'Evergreen Giant'	0.4 -0.6m	0.4 -0.6m	200mm	202
DiIr	Dietes iridiodes	Fornight Lily	0.75 - 0.9m	0.9 - 1.2m	140mm	27
WeGB	Westringia fruticosa 'Grey Box'	Coastal Rosemary	0.3 - 0.45m	0.3 - 0.6m	200mm	107
LomT	Lomandra longifolia 'Tanika'	Spiny-head mat rush	0.45 - 0.6m	0.6 - 0.9m	200mm	263

PLANT SCHEDULE - PL02 - LANDSCAPE AREA (50M2)

ID	Botanical Name	Common Name	Height	Width	Pot Size	Rate /m2	Distribution %	QTY
						0	0	0
CorFru	Cordyline fruticosa	ti plant, palm lily, Cordyline 'Rubra'	1.5 - 3m	0.9 - 1.2m	200mm	0.25	100	13
GaSi-1	Gahnia sieberiana	Red-fruit Saw Sedge	0.9 - 1.5m	1.2 - 2.0m	140mm	0.25	100	13
AlBr	alocasia brisbanienses	Elephants Ear	5 - 10m	1.2 - 2.0m	400mm	0.25	100	13
AsAu-1	Asplenium australasicum	Crow's Nest Fern	0.9 - 1.5m	2.0 - 3.5m	400mm	0.5	100	25
CoSt-1	Cordyline stricta	Narrow-leaved Palm Lily	3 - 5m	0.6 - 0.9m	200mm	0.5	100	25
DiaCaeKA	Dianella caerulea 'King Alfred'	Paroo Lily, Blue Flax-lily	0.45 - 0.6m	0.3 - 0.6m	200mm	0.75	100	38
AuDu	Austromyrtus dulcis	Midgen Berry	1.50 - 3m	0.9 - 1.2m	200mm	1	100	49
DaPy-1	Davallia pyxidata	Hare's Foot Fern	0.75 - 0.9m	0.6 - 0.9m	140mm	1.5	100	74

****PL01 INDIGENOUS LANDSCAPE AREA (85m2)**

ID	Botanical Name	Common Name	Height	Width	Pot Size	Rate/m2	distribution%	QTY
FiNo	Ficinia nodosa	knobby club-rush	0.75 - 0.9m	0.0 - 0.3m	140mm	2	100	284
AuDu	Austromyrtus dulcis	Midgen Berry	1.50 - 3m	0.9 - 1.2m	200mm	1	100	142
BanInt	Banksia integrifolia 'Rollercoaster'	Coastal Banksia	0.9 - 1.5m	0.9 - 1.2m	140mm	2	100	284
CaCi	Callistemon citrinus 'White Anzac'	Lemon-scented Bottlebrush	1.5 - 3m	1.2 - 2.0m	200mm	1	100	142
LePo	Leptospermum polygalifolium 'Vertical Drop'	Prostrate Tea Tree	1.5 - 3m	3.5 - 6m	200mm	1	100	142
LoFi	Lomandra filiformis	Wattle Mat-rush	0.0 - 0.3m	0.0 - 0.3m	140mm	2	100	284

PLANT SCHEDULE - SUPPLEMENTARY PLANTING AREA

ID	Botanical Name	Common Name	Height	Width	Pot Size	Rate /m2	Distribution %	QTY
RaOP	Rhaphiolepis indica 'Oriental Pearl'	Indian Hawthorn	0.9 - 1.2m	0.9 - 1.2m	140mm	1	20	22
DiIrMo	Dietes iridioides (Moraea iridioides)	African Iris	0.75 - 0.9m	variable	140mm	2	20	43
MyPa	Myoporum parvifolium	Carpet Spreading Myoporum	0.45 - 0.6m	0.9 - 1.2m	140mm	2	20	43

****PL01** FINAL SPECIES SELECTION TO BE IN ACCORDANCE WITH JALI LOCAL ABORIGINAL LAND COUNCIL & INDIGENOUS NURSERY COORDINATED BY WOLLONGBAR TAFE.

****PL01** INDIGENOUS SCHEDULE INDICATES TOTAL APPROXIMATE PLANT NUMBERS REQUIRED, TO BE SUPPLIED BY LOCAL ABORIGINAL PLANT NURSERIES.

REV	DATE	COMMENTS
3	11/7/25	GENERAL UPDATE
2	10/7/25	REVISED PLANT SCHEDULES
1	1/7/25	REVISED TENDER ISSUE

PROJECT:
Wollongbar TAFE Northern Rivers Stage 2

DRAWING:
SCHEDULES

SITE:
65 Sneaths Road Wollongbar

CLIENT:
TAFE NSW

WORK TO FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS, LEVELS ON SITE PRIOR TO ORDERING MATERIALS OR COMPLETION OF WORKSHOP DRAWINGS
15237.5 - Wollongbar TAFE Northern Rivers STAGE 2.pln22.CC

DRAWN: AN/ GF
DATE: 6/11/24
SCALE: @A3

JOB NUMBER: **15237.5** PHASE: **CC** DWG No: **L902** REV: **3**

terras landscape architects
412 KING STREET NEWCASTLE NSW AUSTRALIA 2300
TERRAS.COM.AU PH: 49 294 926

PARTIAL DETAIL SURVEY OF
LOT 10 IN DP 874987
61 Sneaths Road
WOLLONGBAR NSW 2477
LEVEL AND DETAIL SURVEY PLAN
CLIENT: TAFE NSW

DRAWING SCHEDULE

DWG. No.		REVISION
40701_L-01	OVERALL PLAN/COVER SHEET	B
40701_L-02	DETAIL SURVEY SHEET 02	B
40701_L-03	DETAIL SURVEY SHEET 03	B
40701_L-04	DETAIL SURVEY SHEET 04	B
40701_L-05	DETAIL SURVEY SHEET 05	B
40701_L-06	DETAIL SURVEY SHEET 06	B
40701_L-07	DETAIL SURVEY SHEET 07	B
40701_L-08	DETAIL SURVEY SHEET 08	B
40701_L-09	DETAIL SURVEY SHEET 09	B
40701_L-10	LEGEND AND NOTES	B

WARNING:

1. This plan has been prepared for the named client from a combination of field survey and existing records for the purpose of showing the physical features of the land to assist in designing future development, and should not be used for any other purpose.

2. The title boundaries shown hereon were not verified or marked at the time of survey but were determined by existing title dimensions and occupations (where available). As such, the location and dimensions of the boundaries shown may vary to that which is actually available at the site. This plan should not be used for building to boundary, or to prescribed set-backs, without an accurate boundary survey.

3. Only the apparent physical features of services (manholes, pits, valves, fittings etc) have been located during this survey. The position of underground alignments where shown are approximate only.

   Where no apparent physical features exist, known services have been shown from the records of the relevant authorities or service providers, where available and have been noted accordingly on this plan.

   The true position of any underground service can only be determined by pot holing or remote detection.

   The position of service alignments shown on this plan must not be relied upon when designing services or buildings to be located in close proximity to them. If existing services are critical for design and construction purposes, the service location must be accurately determined by pot holing or verification on site by the relevant service authority prior to the commencement of design or construction.

4. Prior to any demolition, excavation or construction on site, the relevant person should make independent and updated enquiry of the 'Dial Before You Dig' service and any relevant service providers for the purposes of:
   - Verification of all services plotted from records only; and
   - Possible location of any services altered since this survey was completed or any new services installed on or adjacent to the site.

5. No responsibility can be accepted Barnson Pty Ltd for any damage caused to any underground service or any loss or injury so suffered if enquiry and verification have not been completed in accordance with this note.

6. Whilst care has been taken by the field surveyor to identify the various trees located during the survey, identification may not be accurate and should not be relied upon. If accurate identification of tree types is to be relied upon for any purpose, then all trees listed will require site verification by a suitably qualified expert.

7. **The coordinates shown on this plan and digital file of the same are on a local (GROUND) datum.**

8. A Combined Scale Factor (CSF) of 0.999587 needs to be applied to local (GROUND) coordinates to scale and calculate MGA2020 (GRID) coordinates. This needs to be applied about the origin point of the local datum, being PM161922.

9. If there are any uncertainties or questions regarding the transformation between local (GROUND) coordinates and MGA2020 (GRID) coordinates, please contact Barnson Pty Ltd.

10. Contours shown hereon depict the general topography of the site and do not represent the exact level at any particular point. Variations in contours may occur due to earthworks undertaken after the date of survey.

11. This note is an integral part of this plan. Reproduction of this plan or any part of this plan without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

    NOTE: The survey is based on the Australian Height Datum (AHD) established from PM161922 which is shown to have a Reduced Level of 171.973m AUSTRALIAN HEIGHT DATUM (A.H.D.). The reduced level has been obtained from the Survey Control Information Management Systems (SCIMS) Search Date: 25.01.23.

12. Any third party provided with the control supplied by or relating to this plan and the digital version of the same, should independantly verify said control before use.

DATE OF SURVEY : FEB/MARCH 2023
SURVEY BY : A. Wright

DATUM : AUSTRALIAN HEIGHT DATUM (A.H.D.)
ORIGIN : PM161922 RL 171.973m (S.C.I.M.S.)
MAJOR CONTOUR INTERVAL : 1 METRE
MINOR CONTOUR INTERVAL : 0.2 METRES

OVERALL PLAN/COVER SHEET

REDUCTION RATIO 1:3000 @ A1
1:6000 @ A3

SCALE 1:3000(A1)
0 20 40 80 120 160 200
0 20 40 80 120 160 200
SCALE 1:6000(A3)

ISSUED TO CLIENT

barnson
DESIGN.PLAN.MANAGE

BARNSON PTY LTD
t 1300 BARNSON (1300 227 676)
e generalenquiry@barnson.com.au
w www.barnson.com.au
Bathurst | Coffs Harbour | Dubbo | Mudgee | Sydney | Tamworth

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL BUILDING DRAWINGS, SPECIFICATIONS & OTHER CONSULTANTS DRAWINGS APPLICABLE TO THIS PROJECT. DO NOT SCALE. DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK. REPORT DISCREPANCIES TO BARNSON PTY LTD. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF BARNSON PTY LTD.

Client: TAFE NSW
Project: PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987
61 SNEATHS ROAD
WOLLONGBAR NSW 2477
Drawing Title: LEVEL AND DETAIL SURVEY PLAN
OVERALL PLAN/COVER SHEET

Rev	Date	Amendment
A	31-03-2023	PRELIMINARY ISSUE
B	06-04-2023	ISSUED TO CLIENT

Survey AW Certification
Drawn JC JS
Check AW
Original Sheet Size = A1
Drawing Number 40701 - L01-01
Revision B

DIAL BEFORE YOU DIG
www.1100.com.au

DETAIL SURVEY SHEET 02

REDUCTION RATIO 1:500 @ A1
1:1000 @ A3

SCALE 1:500(A1)
0 5 10 20 30 40 50
SCALE 1:1000(A3)
0 5 10 20 30 40 50

DATE OF SURVEY : FEB/MARCH 2023
SURVEY BY : A. Wright

DATUM : AUSTRALIAN HEIGHT DATUM (A.H.D.)
ORIGIN : PM161922 RL 171.973m (S.C.I.M.S.)
MAJOR CONTOUR INTERVAL : 1 METRE
MINOR CONTOUR INTERVAL : 0.2 METRES

N
M.G.A.

LOT 13
DP262721

LOT 14
DP262721

LOT 15
DP262721

EXISTING BUILDING
EXISTING BUILDING BLOCK G
TOILETS
EDGE OF CONCRETE
EDGE OF BITUMEN
KERB
PAVING
PATH
STAIRS
DRAIN GRATE
DRAIN PIT GRATE RL 172.305
GRATED PIT GRATE RL 169.975 Ø450 OUT INV 168.565
GRATED PIT GRATE RL 169.26 Ø150 OUT INV 168.705
GRATED PIT GRATE RL 169.59 Ø450 T.O/ 168.60 Ø450 IN INV 168.53 Ø450 OUT INV 168.48
KERB INLET PIT GRATE RL 171.93 ...0 OUT INV 170.89
GRATED PIT GRATE RL 168.47 Ø375 OUT INV 167.895
YSD PIT GRATE RL 173.544
GRATED PIT GRATE RL 173.715 Ø225 IN INV 172.085 Ø225 IN INV 172.06 Ø225 OUT INV 172.055
GRATED PIT GRATE RL 172.855 Ø375 OUT INV 171.795
TPIT
FHYD
HYD
WM
LP
TAP
TMP
PP
PPT
SP
STAY
OE
375mm Ø
225mm Ø
150mm Ø
100mm Ø

ISSUED TO CLIENT

barnson
DESIGN . PLAN . MANAGE

BARNSON PTY LTD
t 1300 BARNSON (1300 227 676)
e generalenquiry@barnson.com.au
w www.barnson.com.au
Bathurst | Coffs Harbour | Dubbo | Mudgee | Sydney | Tamworth

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL BUILDING DRAWINGS, SPECIFICATIONS & OTHER CONSULTANTS DRAWINGS APPLICABLE TO THIS PROJECT. DO NOT SCALE. DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK. REPORT DISCREPANCIES TO BARNSON PTY LTD. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF BARNSON PTY LTD.

Client: TAFE NSW

Project: PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title: LEVEL AND DETAIL SURVEY PLAN
DETAIL SURVEY SHEET 02

Rev	Date	Amendment
A	31-03-2023	PRELIMINARY ISSUE
B	06-04-2023	ISSUED TO CLIENT

Survey AW
Drawn JC JS
Check AW
Original Sheet Size = A1

Certification

Drawing Number 40701 - L01-02

Revision B

DIAL BEFORE YOU DIG
www.1100.com.au

EXISTING BUILDING BLOCK G
EXISTING BUILDING BLOCK O
EXISTING BUILDING BLOCK H VEHICLE PAINT & PANEL
EXISTING BUILDING BLOCK E AUTOMOTIVE
EXISTING BUILDING BLOCK F FACILITIES TEAM
EXISTING BUILDING BLOCK D
EXISTING BUILDING BLOCK C
EXISTING BUILDING BLOCK N
EXISTING BUILDING BLOCK B
EXISTING BUILDING BLOCK P
LOT 11 DP874987
LOT 12 DP874987
CARPARK
TENNIS COURT
FENCED GAS STORAGE TANKS
UNDERCOVER SEATING
SHED
TOILETS
GAZEBO
TANK
M.G.A.

DATE OF SURVEY : FEB/MARCH 2023
SURVEY BY : A. Wright

DATUM : AUSTRALIAN HEIGHT DATUM (A.H.D.)
ORIGIN : PM161922 RL 171.973m (S.C.I.M.S.)
MAJOR CONTOUR INTERVAL : 1 METRE
MINOR CONTOUR INTERVAL : 0.2 METRES

DETAIL SURVEY SHEET 03

REDUCTION RATIO 1:500 @ A1
1:1000 @ A3

SCALE 1:500(A1)
0 5 10 20 30 40 50
SCALE 1:1000(A3)
0 5 10 20 30 40 50

(A) EASEMENT FOR UNDERGROUND ELECTRICITY PURPOSES 1 & 2 WIDE (VIDE DP 874987)

ISSUED TO CLIENT

barnson
DESIGN . PLAN . MANAGE

BARNSON PTY LTD
t 1300 BARNSON (1300 227 676)
e generalenquiry@barnson.com.au
w www.barnson.com.au
Bathurst | Coffs Harbour | Dubbo | Mudgee | Sydney | Tamworth

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL BUILDING DRAWINGS, SPECIFICATIONS & OTHER CONSULTANTS DRAWINGS APPLICABLE TO THIS PROJECT. DO NOT SCALE. DIMENSIONS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORK. REPORT DISCREPANCIES TO BARNSON PTY LTD. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF BARNSON PTY LTD.

Client: TAFE NSW
Project: PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987
61 SNEATHS ROAD
WOLLONGBAR NSW 2477
Drawing Title: LEVEL AND DETAIL SURVEY PLAN
DETAIL SURVEY SHEET 03

Rev	Date	Amendment
A	31-03-2023	PRELIMINARY ISSUE
B	06-04-2023	ISSUED TO CLIENT

Survey AW
Drawn JC JS
Check AW
Original Sheet Size = A1
Certification
Drawing Number 40701 - L01-03
Revision B

DIAL BEFORE YOU DIG
www.1100.com.au

DETAIL SURVEY SHEET 04

REDUCTION RATIO 1:500 @ A1
1:1000 @ A3

SCALE 1:500(A1)

0 5 10 20 30 40 50

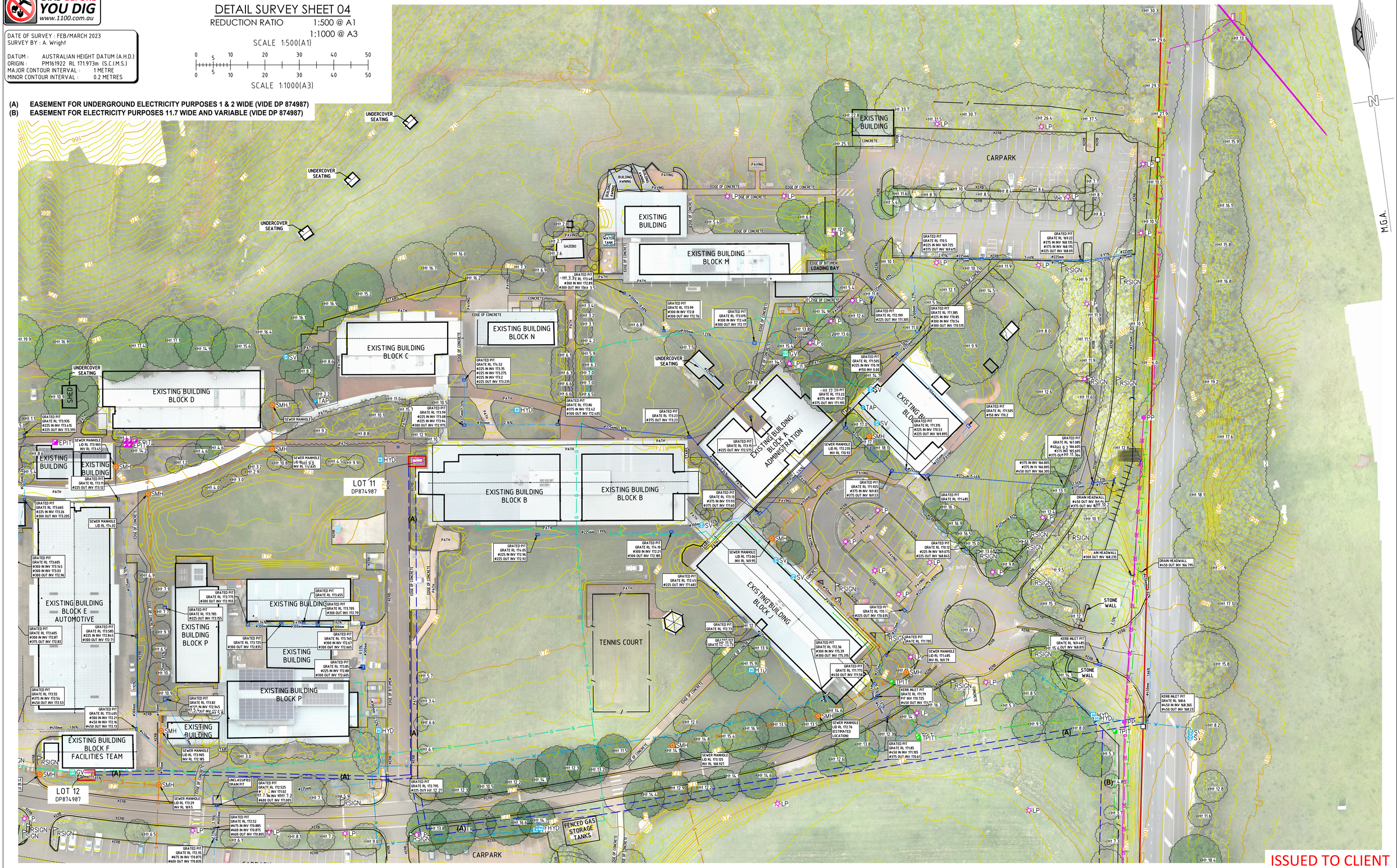
SCALE 1:1000(A3)

0 5 10 20 30 40 50

DATE OF SURVEY : FEB/MARCH 2023
SURVEY BY : A. Wright

DATUM : AUSTRALIAN HEIGHT DATUM (A.H.D.)
ORIGIN : PM161922 RL 171.973m (S.C.I.M.S.)
MAJOR CONTOUR INTERVAL : 1 METRE
MINOR CONTOUR INTERVAL : 0.2 METRES

(A) EASEMENT FOR UNDERGROUND ELECTRICITY PURPOSES 1 & 2 WIDE (VIDE DP 874987)
(B) EASEMENT FOR ELECTRICITY PURPOSES 11.7 WIDE AND VARIABLE (VIDE DP 874987)



ISSUED TO CLIENT

barnson
DESIGN . PLAN . MANAGE

BARNSON PTY LTD
t 1300 BARNSON (1300 227 676)
e generalenquiry@barnson.com.au
w www.barnson.com.au
Bathurst | Coffs Harbour | Dubbo | Mudgee | Sydney | Tamworth

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL BUILDING DRAWINGS, SPECIFICATIONS & OTHER CONSULTANTS DRAWINGS APPLICABLE TO THIS PROJECT. DO NOT SCALE. DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK. REPORT DISCREPANCIES TO BARNSON PTY LTD. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF BARNSON PTY LTD.

Client: TAFE NSW
Project: PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987
61 SNEATHS ROAD
WOLLONGBAR NSW 2477
Drawing Title: LEVEL AND DETAIL SURVEY PLAN
DETAIL SURVEY SHEET 04

Rev	Date	Amendment
A	31-03-2023	PRELIMINARY ISSUE
B	06-04-2023	ISSUED TO CLIENT

Survey AW
Drawn JC JS
Check AW
Original Sheet Size = A1

Certification

Drawing Number 40701 - L01-04

Revision B

DATE OF SURVEY : FEB/MARCH 2023
SURVEY BY : A. Wright

DATUM : AUSTRALIAN HEIGHT DATUM (A.H.D.)
ORIGIN : PM161922 RL 171.973m (S.C.I.M.S.)
MAJOR CONTOUR INTERVAL : 1 METRE
MINOR CONTOUR INTERVAL : 0.2 METRES

DETAIL SURVEY SHEET 05

REDUCTION RATIO 1:500 @ A1
1:1000 @ A3

SCALE 1:500(A1)
0 5 10 20 30 40 50
SCALE 1:1000(A3)
0 5 10 20 30 40 50

(A) EASEMENT FOR UNDERGROUND ELECTRICITY PURPOSES 1 & 2 WIDE (VIDE DP 874987)
(B) EASEMENT FOR ELECTRICITY PURPOSES 11.7 WIDE AND VARIABLE (VIDE DP 874987)

DIAL BEFORE YOU DIG www.1100.com.au

ISSUED TO CLIENT

barnson
DESIGN . PLAN . MANAGE

BARNSON PTY LTD
t 1300 BARNSON (1300 227 676)
e generalenquiry@barnson.com.au
w www.barnson.com.au
Bathurst | Coffs Harbour | Dubbo | Mudgee | Sydney | Tamworth

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL BUILDING DRAWINGS, SPECIFICATIONS & OTHER CONSULTANTS DRAWINGS APPLICABLE TO THIS PROJECT. DO NOT SCALE. DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK. REPORT DISCREPANCIES TO BARNSON PTY LTD. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF BARNSON PTY LTD.

Client: TAFE NSW
Project: PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987
61 SNEATHS ROAD
WOLLONGBAR NSW 2477
Drawing Title: LEVEL AND DETAIL SURVEY PLAN
DETAIL SURVEY SHEET 05

Rev	Date	Amendment
A	31-03-2023	PRELIMINARY ISSUE
B	06-04-2023	ISSUED TO CLIENT

Survey AW
Drawn JC JS
Check AW
Original Sheet Size = A1
Certification
Drawing Number 40701 - L01-05
Revision B

DIAL BEFORE YOU DIG
www.1100.com.au

EDGE OF CONCRETE
DRAIN GRATE
DRAIN PIT
GRATED PIT GRATE RL 173.546
TOILETS
EXISTING BUILDING
EXISTING BUILDING BLOCK G
EXISTING BUILDING BLOCK O
EXISTING BUILDING BLOCK H VEHICLE PAINT & PANEL
EXISTING BUILDING BLOCK E AUTOMOTIVE
EXISTING BUILDING BLOCK F FACILITIES TEAM
UNDERCOVER SEATING
SHED
PATH
KERB
EDGE OF BITUMEN
PAVING
STAIRS
KERB INLET PIT
SEWER MANHOLE LID RL 173.72 INV RL 171.71
SEWER MANHOLE LID RL 174.61 INV RL 171.37
SEWER MANHOLE LID RL 174.325 INV RL 172.02
SEWER MANHOLE LID RL 174.2 INV RL 170.85
SEWER MANHOLE LID RL 173.185 INV RL 170.075
SEWER MANHOLE LID RL 174.02
SEWER LINE PEAR
GRATED PIT GRATE RL 173.715 Ø225 IN INV 172.085 Ø225 IN INV 172.06 Ø225 OUT INV 172.055
GRATED PIT GRATE RL 173.095 Ø225 IN INV 171.865 Ø300 OUT INV 171.78
GRATED PIT GRATE RL 172.855 Ø375 OUT INV 171.795
GRATED PIT GRATE RL 172.90 Ø300 IN INV 171.49 Ø300 IN INV 171.515 Ø375 OUT INV 171.40
GRATED PIT GRATE RL172.555 Ø375 IN INV 171.215 Ø375 OUT INV 171.155
GRATED PIT GRATE RL172.535 Ø375 IN INV 171.36 Ø375 IN INV 171.310 Ø375 OUT INV 171.33
GRATED PIT GRATE RL 173.575 Ø110 IN INV 172.925 Ø225 OUT INV 172.485
GRATED PIT GRATE RL 174.10 Ø225 OUT INV 173.485
GRATED PIT GRATE RL 174.19 Ø225 IN INV 173.65 Ø225 OUT INV 173.62
GRATED PIT GRATE RL 174.255 Ø150 IN INV 173.605 Ø150 IN INV 173.45 Ø150 IN INV 173.31 Ø300 OUT INV 173.255
GRATED PIT GRATE RL 173.935 Ø225 IN INV 173.415 Ø225 OUT INV 173.395
GRATED PIT GRATE RL 173.665 Ø225 IN INV 173.26 Ø300 OUT INV 173.205
GRATED PIT GRATE RL 173.605 Ø300 IN INV 173.145 Ø300 IN INV 173.03 Ø300 OUT INV 172.96
GRATED PIT GRATE RL 173.605 Ø300 IN INV 172.87 Ø375 OUT INV 172.82
GRATED PIT GRATE RL 173.585 Ø225 IN INV 172.845 Ø300 OUT INV 172.71
GRATED PIT GRATE RL 173.55 Ø375 IN INV 172.54 Ø450 OUT INV 172.53
GRATED PIT GRATE RL 173.405 Ø300 IN INV 172.21 Ø450 IN INV 172.16 Ø450 OUT INV 172.13
GRATED PIT GRATE RL 173.11 Ø225 OUT INV 173.12
GRATED PIT GRATE RL 171.855 Ø375 OUT INV 171.795
KERB INLET PIT GRATE RL172.9 Ø300 OUT INV 171.78
HYD
SV
IO
EPIT
TPIT
WM
GV
RSIGN
LP
SMH
LOT 12 DP874987

DETAIL SURVEY SHEET 06

REDUCTION RATIO 1:300 @ A1
1:600 @ A3

DATE OF SURVEY : FEB/MARCH 2023
SURVEY BY : A. Wright

DATUM : AUSTRALIAN HEIGHT DATUM (A.H.D.)
ORIGIN : PM161922 RL 171.973m (S.C.I.M.S.)
MAJOR CONTOUR INTERVAL : 1 METRE
MINOR CONTOUR INTERVAL : 0.2 METRES

SCALE 1:300(A1)
0 5 10 15 20 25
0 5 10 15 20 25
SCALE 1:600(A3)

(A) EASEMENT FOR UNDERGROUND ELECTRICITY PURPOSES 1 & 2 WIDE (VIDE DP 874987)

ISSUED TO CLIENT

M.G.A.

barnson
DESIGN . PLAN . MANAGE

BARNSON PTY LTD
t 1300 BARNSON (1300 227 676)
e generalenquiry@barnson.com.au
w www.barnson.com.au
Bathurst | Coffs Harbour | Dubbo | Mudgee | Sydney | Tamworth

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL BUILDING DRAWINGS, SPECIFICATIONS & OTHER CONSULTANTS DRAWINGS APPLICABLE TO THIS PROJECT. DO NOT SCALE. DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK. REPORT DISCREPANCIES TO BARNSON PTY LTD. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF BARNSON PTY LTD.

Client: TAFE NSW
Project: PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987
61 SNEATHS ROAD
WOLLONGBAR NSW 2477
Drawing Title: LEVEL AND DETAIL SURVEY PLAN
DETAIL SURVEY SHEET 06

Rev	Date	Amendment
A	31-03-2023	PRELIMINARY ISSUE
B	06-04-2023	ISSUED TO CLIENT

Survey AW
Drawn JC JS
Check AW
Original Sheet Size = A1
Certification
Drawing Number 40701 - L01-06
Revision B

DIAL BEFORE YOU DIG
www.1100.com.au

DETAIL SURVEY SHEET 07

REDUCTION RATIO 1:300 @ A1
1:600 @ A3

SCALE 1:300(A1)
0 5 10 15 20 25

SCALE 1:600(A3)
0 5 10 15 20 25

DATE OF SURVEY : FEB/MARCH 2023
SURVEY BY : A. Wright

DATUM : AUSTRALIAN HEIGHT DATUM (A.H.D.)
ORIGIN : PM161922 RL 171.973m (S.C.I.M.S.)
MAJOR CONTOUR INTERVAL : 1 METRE
MINOR CONTOUR INTERVAL : 0.2 METRES

(A) EASEMENT FOR UNDERGROUND ELECTRICITY PURPOSES 1 & 2 WIDE (VIDE DP 874987)

LOT 11
DP874987

LOT 12
DP874987

EXISTING BUILDING BLOCK C
EXISTING BUILDING BLOCK D
EXISTING BUILDING BLOCK N
EXISTING BUILDING BLOCK B
EXISTING BUILDING BLOCK A ADMINISTRATION
EXISTING BUILDING BLOCK E AUTOMOTIVE
EXISTING BUILDING BLOCK F FACILITIES TEAM
EXISTING BUILDING BLOCK P
EXISTING BUILDING BLOCK J
TENNIS COURT
SHED
UNDERCOVER SEATING

GRATED PIT GRATE RL 173.935 Φ225 IN INV 173.415 Φ225 OUT INV 173.395
GRATED PIT GRATE RL 173.11 Φ225 OUT INV 173.12
GRATED PIT GRATE RL 173.665 Φ225 IN INV 173.26 Φ300 OUT INV 173.205
GRATED PIT GRATE RL 173.605 Φ300 IN INV 173.145 Φ300 IN INV 173.03 Φ300 OUT INV 172.96
GRATED PIT GRATE RL 173.605 Φ300 IN INV 172.87 Φ375 OUT INV 172.82
GRATED PIT GRATE RL 173.585 Φ225 IN INV 172.845 Φ300 OUT INV 172.71
GRATED PIT GRATE RL 173.55 Φ375 IN INV 172.54 Φ450 OUT INV 172.53
GRATED PIT GRATE RL 173.405 Φ300 IN INV 172.21 Φ450 IN INV 172.16 Φ450 OUT INV 172.13
GRATED PIT GRATE RL 173.775 Φ300 OUT INV 172.955
GRATED PIT GRATE RL 173.785 Φ225 OUT INV 173.155
GRATED PIT GRATE RL 173.655
GRATED PIT GRATE RL 173.705 Φ300 OUT INV 172.79
GRATED PIT GRATE RL 173.725 Φ300 OUT INV 172.835
GRATED PIT GRATE RL 173.765 Φ300 IN INV 172.67 Φ300 OUT INV 172.665
GRATED PIT GRATE RL 173.85 Φ225 IN INV 172.88 Φ300 OUT INV 172.605
GRATED PIT GRATE RL 173.82 Φ225 IN INV 172.945 Φ225 OUT INV 172.8
GRATED PIT GRATE RL 174.52 Φ225 IN INV 173.35 Φ225 IN INV 173.275 Φ225 IN INV 173.2 Φ225 OUT INV 173.235
GRATED PIT GRATE RL 173.99 Φ225 IN INV 173.08 Φ225 IN INV 173.94 Φ300 OUT INV 172.975
GRATED PIT GRATE RL 173.86 Φ375 IN INV 172.42 Φ300 OUT INV 172.405
GRATED PIT GRATE RL 173.23 Φ375 OUT INV 173.23
GRATED PIT GRATE RL 173.15 Φ225 OUT INV 172.575
GRATED PIT GRATE RL 173.99 Φ300 IN INV 172.8 Φ300 OUT INV 172.76
GRATED PIT GRATE RL 173.015 Φ300 IN INV 172.48 Φ300 OUT INV 172.17
GRATED PIT GRATE RL 173.13 Φ375 IN INV 171.93 Φ375 OUT INV 171.60
GRATED PIT GRATE RL 174.05 Φ225 IN INV 172.96 Φ225 OUT INV 172.92
GRATED PIT GRATE RL 174.10 Φ300 IN INV 172.21 Φ300 OUT INV 172.185
GRATED PIT GRATE RL 172.45 Φ225 OUT INV 171.682
GRATED PIT GRATE RL 172.795 Φ225 OUT INV 172.27
GRATED PIT GRATE RL 172.525 Φ173 IN INV 171.02 Φ600 OUT INV 171.005
GRATED PIT GRATE RL 172.73
GRATED PIT GRATE RL 173.93

SEWER MANHOLE LID RL 173.965 INV RL 173.45
SEWER MANHOLE LID RL 173.905 INV RL 173.0 INV RL 172.835
SEWER MANHOLE LID RL 174.02
SEWER MANHOLE LID RL 173.185 INV RL 170.075
SEWER MANHOLE LID RL 173.29 INV RL 169.5
SEWER MANHOLE LID RL 173.185 INV RL 172.185
SEWER MANHOLE LID RL 173.06 INV RL 169.95
SEWER MANHOLE LID RL 173.125 INV RL 168.927

UNCLASSIFIED DRAIN PIT

ISSUED TO CLIENT

barnson
DESIGN . PLAN . MANAGE

BARNSON PTY LTD
t 1300 BARNSON (1300 227 676)
e generalenquiry@barnson.com.au
w www.barnson.com.au
Bathurst | Coffs Harbour | Dubbo | Mudgee | Sydney | Tamworth

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL BUILDING DRAWINGS, SPECIFICATIONS & OTHER CONSULTANTS DRAWINGS APPLICABLE TO THIS PROJECT. DO NOT SCALE. DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK. REPORT DISCREPANCIES TO BARNSON PTY LTD. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF BARNSON PTY LTD.

Client: TAFE NSW
Project: PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987
61 SNEATHS ROAD
WOLLONGBAR NSW 2477
Drawing Title: LEVEL AND DETAIL SURVEY PLAN
DETAIL SURVEY SHEET 07

Rev	Date	Amendment
A	31-03-2023	PRELIMINARY ISSUE
B	06-04-2023	ISSUED TO CLIENT

Survey AW Certification
Drawn JC JS
Check AW
Original Sheet Size = A1
Drawing Number 40701 - L01-07
Revision B

DIAL BEFORE YOU DIG
www.1100.com.au

DETAIL SURVEY SHEET 08

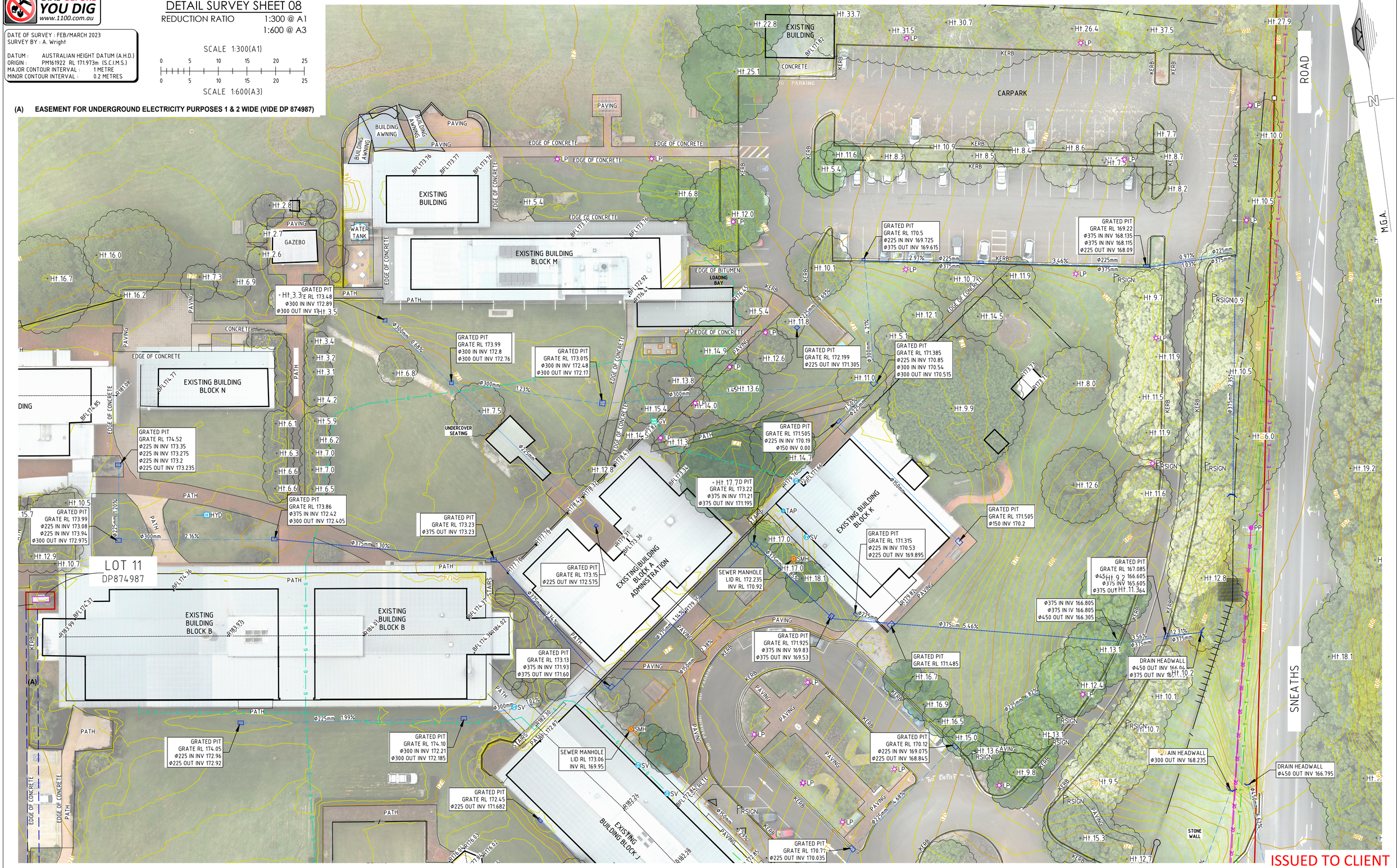
REDUCTION RATIO 1:300 @ A1
1:600 @ A3

SCALE 1:300(A1)
0 5 10 15 20 25
SCALE 1:600(A3)
0 5 10 15 20 25

DATE OF SURVEY : FEB/MARCH 2023
SURVEY BY : A. Wright

DATUM : AUSTRALIAN HEIGHT DATUM (A.H.D.)
ORIGIN : PM161922 RL 171.973m (S.C.I.M.S.)
MAJOR CONTOUR INTERVAL : 1 METRE
MINOR CONTOUR INTERVAL : 0.2 METRES

(A) EASEMENT FOR UNDERGROUND ELECTRICITY PURPOSES 1 & 2 WIDE (VIDE DP 874987)



barnson
DESIGN . PLAN . MANAGE

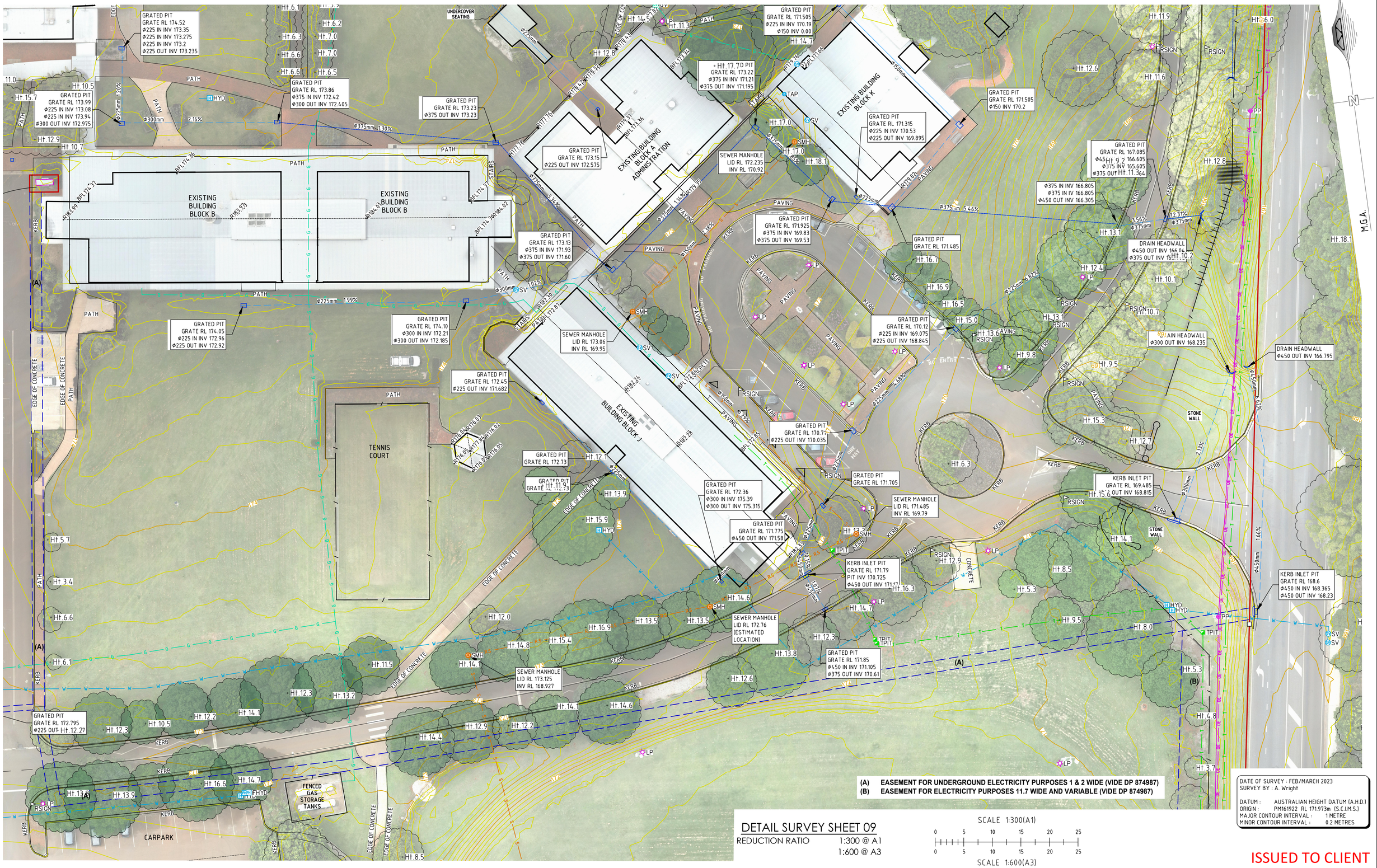
BARNSON PTY LTD
t 1300 BARNSON (1300 227 676)
e generalenquiry@barnson.com.au
w www.barnson.com.au
Bathurst | Coffs Harbour | Dubbo | Mudgee | Sydney | Tamworth

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL BUILDING DRAWINGS, SPECIFICATIONS & OTHER CONSULTANTS DRAWINGS APPLICABLE TO THIS PROJECT. DO NOT SCALE. DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK. REPORT DISCREPANCIES TO BARNSON PTY LTD. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF BARNSON PTY LTD.

Client: TAFE NSW
Project: PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987
61 SNEATHS ROAD
WOLLONGBAR NSW 2477
Drawing Title: LEVEL AND DETAIL SURVEY PLAN
DETAIL SURVEY SHEET 08

Rev	Date	Amendment
A	31-03-2023	PRELIMINARY ISSUE
B	06-04-2023	ISSUED TO CLIENT

Survey AW
Drawn JC JS
Check AW
Original Sheet Size = A1
Certification
Drawing Number 40701 - L01-08
Revision B


EXISTING BUILDING BLOCK B
EXISTING BUILDING BLOCK A ADMINISTRATION
EXISTING BUILDING BLOCK K
EXISTING BUILDING BLOCK J
TENNIS COURT
CARPARK
FENCED GAS STORAGE TANKS
UNDERCOVER SEATING
STONE WALL
GRATED PIT GRATE RL 174.52 Ø225 IN INV 173.35 Ø225 IN INV 173.275 Ø225 IN INV 173.2 Ø225 OUT INV 173.235
GRATED PIT GRATE RL 173.99 Ø225 IN INV 173.08 Ø225 IN INV 173.94 Ø300 OUT INV 172.975
GRATED PIT GRATE RL 173.86 Ø375 IN INV 172.42 Ø300 OUT INV 172.405
GRATED PIT GRATE RL 173.23 Ø375 OUT INV 173.23
GRATED PIT GRATE RL 173.15 Ø225 OUT INV 172.575
GRATED PIT GRATE RL 173.13 Ø375 IN INV 171.93 Ø375 OUT INV 171.60
GRATED PIT GRATE RL 174.05 Ø225 IN INV 172.96 Ø225 OUT INV 172.92
GRATED PIT GRATE RL 174.10 Ø300 IN INV 172.21 Ø300 OUT INV 172.185
GRATED PIT GRATE RL 172.45 Ø225 OUT INV 171.682
GRATED PIT GRATE RL 172.73
GRATED PIT GRATE RL 171.505 Ø225 IN INV 170.19 Ø150 INV 0.00
GRATED PIT GRATE RL 173.22 Ø375 IN INV 171.21 Ø375 OUT INV 171.195
GRATED PIT GRATE RL 171.505 Ø150 INV 170.2
GRATED PIT GRATE RL 171.315 Ø225 IN INV 170.53 Ø225 OUT INV 169.895
GRATED PIT GRATE RL 171.925 Ø375 IN INV 169.83 Ø375 OUT INV 169.53
GRATED PIT GRATE RL 171.485
GRATED PIT GRATE RL 170.12 Ø225 IN INV 169.075 Ø225 OUT INV 168.845
GRATED PIT GRATE RL 170.75 Ø225 OUT INV 170.035
GRATED PIT GRATE RL 171.705
GRATED PIT GRATE RL 172.36 Ø300 IN INV 175.39 Ø300 OUT INV 175.315
GRATED PIT GRATE RL 171.775 Ø450 OUT INV 171.58
GRATED PIT GRATE RL 171.85 Ø450 IN INV 171.105 Ø375 OUT INV 170.61
GRATED PIT GRATE RL 172.795 Ø225 OUT INV 172.27
GRATED PIT GRATE RL 167.085 Ø450 INV 166.605 Ø375 INV 165.605 Ø375 OUT INV 166.364
Ø375 IN INV 166.805 Ø375 IN IV 166.805 Ø450 OUT INV 166.305
DRAIN HEADWALL Ø450 OUT INV 166.04 Ø375 OUT INV 166.10
DRAIN HEADWALL Ø300 OUT INV 168.235
DRAIN HEADWALL Ø450 OUT INV 166.795
KERB INLET PIT GRATE RL 169.485 OUT INV 168.815
KERB INLET PIT GRATE RL 171.79 PIT INV 170.725 Ø450 OUT INV 171.17
KERB INLET PIT GRATE RL 168.6 Ø450 IN INV 168.365 Ø450 OUT INV 168.23
SEWER MANHOLE LID RL 172.235 INV RL 170.92
SEWER MANHOLE LID RL 173.06 INV RL 169.95
SEWER MANHOLE LID RL 171.485 INV RL 169.79
SEWER MANHOLE LID RL 172.76 (ESTIMATED LOCATION)
SEWER MANHOLE LID RL 173.125 INV RL 168.927
EDGE OF CONCRETE
KERB
PATH
PAVING
STAIRS
CONCRETE
ONE WAY
RSIGN
HYD
PP
LP
SV
SMH
TAP
TPIT
FHYD
Ø225mm 1.99%
Ø300mm 2.16%
Ø375mm 1.30%
Ø375mm 3.31%
Ø375mm 1.14%
Ø375mm 5.46%
Ø225mm 5.82%
Ø225mm 5.68%
Ø375mm 3.56%
Ø375mm 12.31%
Ø450mm 1.66%
Ø450mm 2.42%
Ø450mm 10.42%
Ø450mm 15.54%
Ø450mm 2.19%
Ø300mm 1.02%
Ø225mm 4.92%
Ø225mm 2.98%
Ø225mm 4.85%
Ø225mm 4.85%
Ø225mm 4.85

LEGEND AND NOTES

LINETYPE LEGEND

- CURRENT SITE BOUNDARY
- FENCE
- MAJOR CONTOURS
- MINOR CONTOURS
- EDGE OF CONCRETE
- EDGE OF BITUMEN
- CENTRELINE OF ROAD
- STORMWATER UNDERGROUND
- ELECTRICITY OVERHEAD
- ELECTRICITY UNDERGROUND
- ELECTRICITY STAY WIRE
- GAS UNDERGROUND - NOTE SHALLOW APPROX 0.2 - 0.3 DEEP
- SEWER UNDERGROUND
- TELECOMMUNICATIONS UNDERGROUND
- UNDERGROUND OPTICAL FIBRE
- WATER UNDERGROUND
- WATERCOURSE
- CHANGE OF GRADE
- ELECTRICAL INFRASTRUCTURE
- RETAINING WALL TOP
- RETAINING WALL BOTTOM

LINETYPE LEGEND

- ELECTRICITY UNDERGROUND (RECORDS)
- GAS UNDERGROUND (RECORDS)
- RECYCLED WATER UNDERGOUND (RECORDS)
- SEWER UNDERGROUND LINE (RECORDS)
- TELECOMMUNICATIONS UNDERGROUND (RECORDS)
- UNDERGROUND OPTICAL FIBRE (RECORDS)
- WATER UNDERGROUND (RECORDS)

RL LEGEND

- +R181.24 — BUILDING RIDGELINE RL
- BFL174.02 — BUILDING FLOOR LEVEL RL
- +Ht 30.4 — TOP OF TREE RL

SYMBOL LEGEND

- WATER FIRE HYDRANT (FHYD)
- ELECTRICAL LIGHT POLE (LP)
- TREE
- BOUNDARY LINE PEG
- HYD WATER HYDRANT
- SMH SEWER MANHOLE
- IO SEWER INSPECTION OPENING
- SV WATER STOP VALVE
- EPIT ELECTRICAL PIT
- TPIT TELECOMMUNICATIONS PIT
- RSIGN ROAD SIGN
- SIGN SIGN

WARNING:

1. This plan has been prepared for the named client from a combination of field survey and existing records for the purpose of showing the physical features of the land to assist in designing future development, and should not be used for any other purpose.

2. The title boundaries shown hereon were not verified or marked at the time of survey but were determined by existing title dimensions and occupations (where available). As such, the location and dimensions of the boundaries shown may vary to that which is actually available at the site. This plan should not be used for building to boundary, or to prescribed set-backs, without an accurate boundary survey.

3. Only the apparent physical features of services (manholes, pits, valves, fittings etc) have been located during this survey. The position of underground alignments where shown are approximate only.

   Where no apparent physical features exist, known services have been shown from the records of the relevant authorities or service providers, where available and have been noted accordingly on this plan.

   The true position of any underground service can only be determined by pot holing or remote detection.

   The position of service alignments shown on this plan must not be relied upon when designing services or buildings to be located in close proximity to them. If existing services are critical for design and construction purposes, the service location must be accurately determined by pot holing or verification on site by the relevant service authority prior to the commencement of design or construction.

4. Prior to any demolition, excavation or construction on site, the relevant person should make independent and updated enquiry of the 'Dial Before You Dig' service and any relevant service providers for the purposes of:
   - Verification of all services plotted from records only; and
   - Possible location of any services altered since this survey was completed or any new services installed on or adjacent to the site.

5. No responsibility can be accepted Barnson Pty Ltd for any damage caused to any underground service or any loss or injury so suffered if enquiry and verification have not been completed in accordance with this note.

6. Whilst care has been taken by the field surveyor to identify the various trees located during the survey, identification may not be accurate and should not be relied upon. If accurate identification of tree types is to be relied upon for any purpose, then all trees listed will require site verification by a suitably qualified expert.

7. **The coordinates shown on this plan and digital file of the same are on a local (GROUND) datum.**

8. A Combined Scale Factor (CSF) of 0.999587 needs to be applied to local (GROUND) coordinates to scale and calculate MGA2020 (GRID) coordinates. This needs to be applied about the origin point of the local datum, being PM161922.

9. If there are any uncertainties or questions regarding the transformation between local (GROUND) coordinates and MGA2020 (GRID) coordinates, please contact Barnson Pty Ltd.

10. Contours shown hereon depict the general topography of the site and do not represent the exact level at any particular point. Variations in contours may occur due to earthworks undertaken after the date of survey.

11. This note is an integral part of this plan. Reproduction of this plan or any part of this plan without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

    NOTE: The survey is based on the Australian Height Datum (AHD) established from PM161922 which is shown to have a Reduced Level of 171.973m AUSTRALIAN HEIGHT DATUM (A.H.D.). The reduced level has been obtained from the Survey Control Information Management Systems (SCIMS) Search Date: 25.01.23.

12. Any third party provided with the control supplied by or relating to this plan and the digital version of the same, should independantly verify said control before use.

ISSUED TO CLIENT

barnson
DESIGN . PLAN . MANAGE

BARNSON PTY LTD
t 1300 BARNSON (1300 227 676)
e generalenquiry@barnson.com.au
w www.barnson.com.au
Bathurst | Coffs Harbour | Dubbo | Mudgee | Sydney | Tamworth

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL BUILDING DRAWINGS, SPECIFICATIONS & OTHER CONSULTANTS DRAWINGS APPLICABLE TO THIS PROJECT. DO NOT SCALE. DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK. REPORT DISCREPANCIES TO BARNSON PTY LTD. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF BARNSON PTY LTD.

Client: TAFE NSW

Project: PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title: LEVEL AND DETAIL SURVEY PLAN
LEGEND AND NOTES

Rev	Date	Amendment
A	31-03-2023	PRELIMINARY ISSUE
B	06-04-2023	ISSUED TO CLIENT

Survey AW
Drawn JC JS
Check AW
Original Sheet Size = A1

Certification

Drawing Number 40701 - L01-10

Revision B

Acoustic Assessment – TAFE Wollongbar Campus Stage 2 New Multi Trades Hub

Prepared for

EJE Architecture

November 2024

Relationships Attention Professional Trust

Document Details

Acoustic Assessment – TAFE Wollongbar Campus Stage 2 New Multi Trades Hub

Prepared For:

EJE Architecture

Prepared By:

RAPT Consulting

18&19 / 10 Kenrick Street

The Junction, NSW 2291

ABN: 30330220290

www.raptconsulting.com.au

Document ID	Rev No.	Date	Author	
2224583_241127	0	27 November 2024	Gregory Collins - MAAS	

Table of Contents

1. INTRODUCTION 6

1.1 Background 6

1.2 Assessment Objectives 7

1.3 Scope 7

1.4 Relevant Guidelines 8

1.5 Limitations 8

2. EXISTING ENVIRONMENT 9

2.1 Land Use 9

3. ACOUSTIC OBJECTIVES 13

3.1 Construction Noise 13

3.2 Construction Sleep Disturbance 15

3.3 Vibration Guidelines 16
3.3.1 Human Exposure 16

3.4 Building Damage 16

3.5 Operational Noise 19

3.6 Road Noise Criteria 20

4. ACOUSTIC ASSESSMENT 22

4.1 Construction Noise 22

4.2 Construction Noise Management Plan 26
4.2.1 Planning and design of construction works 26

4.3 Construction Vibration 27

4.4 Operational Noise 29
4.4.1 Noise Sources 30
4.4.2 Building Components 33

5. CONCLUSION 37

GLOSSARY OF ACOUSTIC TERMS 38

Table Index

Table 2-1 Background and Ambient Noise Monitoring Results 12

Table 3-1 ICNG Recommended Construction Hours 13

Table 3-2 Recommended Construction Noise Management Levels 13

Table 3-3 Construction NML's dB(A) Leq(15min) 15

Table 3-4 Construction Noise Sleep Disturbance Assessment Levels 15

Table 3-5 Acceptable Vibration Values for Intermittent Vibration (m/s1.75) 16

Table 3-6 Guideline values for vibration velocity to be used when evaluating the effects of short-term vibration on structures 17

Table 3-7 Recommended Minimum Safe Working Distances for Vibration Intensive Plant from Sensitive Receiver 18

Table 3-8 Project Noise Trigger Levels dB(A) 20

Table 3-9 Road Noise Policy Goals 20

Table 4-1 Plant and Equipment Noise Levels 22

Table 4-2 Recommended Minimum Safe Working Distances for Vibration Intensive Plant from Sensitive Receiver 28

Table 4-3 Typical Mechanical Plant Sound Power Levels 30

Table 4-4 Modelled Plant Items 31

Table 4-5 Building Element Sound Reductions 33

Table 4-6 Measured Workshop Plant Items 35

Figure Index

Figure 1-1 Site and Surrounding Area 6

Figure 1-2 Location Plan (Source: EJE) 7

Figure 2-1 Land Use Zonings 9

Figure 2-2 Monitoring Location 10

Figure 2-3 Noise Monitoring Location 11

Figure 4-1 Example of Differing Work Areas 24

Figure 4-2 Excavation dB(A) Leq(15min) 25

Figure 4-3 Building Construction dB(A) Leq(15min) 25

Figure 4-4 Rooftop Plan (Source: EJE) 30

Figure 4-5 Operational Noise dB(A) Leq(15min) 34

1. Introduction

1.1 Background

RAPT Consulting has been engaged to undertake acoustic services for EJE Architecture as part of the TAFE Wollongbar Stage 2 Project. The site is located at 61 Sneaths Road Wollongbar, NSW.

This assessment is for the new Multi-Trades Hub

The new Multi-Trade Hub for construction courses including carpentry, cabinet making, electrotechnology, plumbing and other trade training accommodation.

The project site and surrounding area is shown in Figure 1-1 and Site Location Plan is shown in Figure 1-2.

Figure 1-1 Site and Surrounding Area

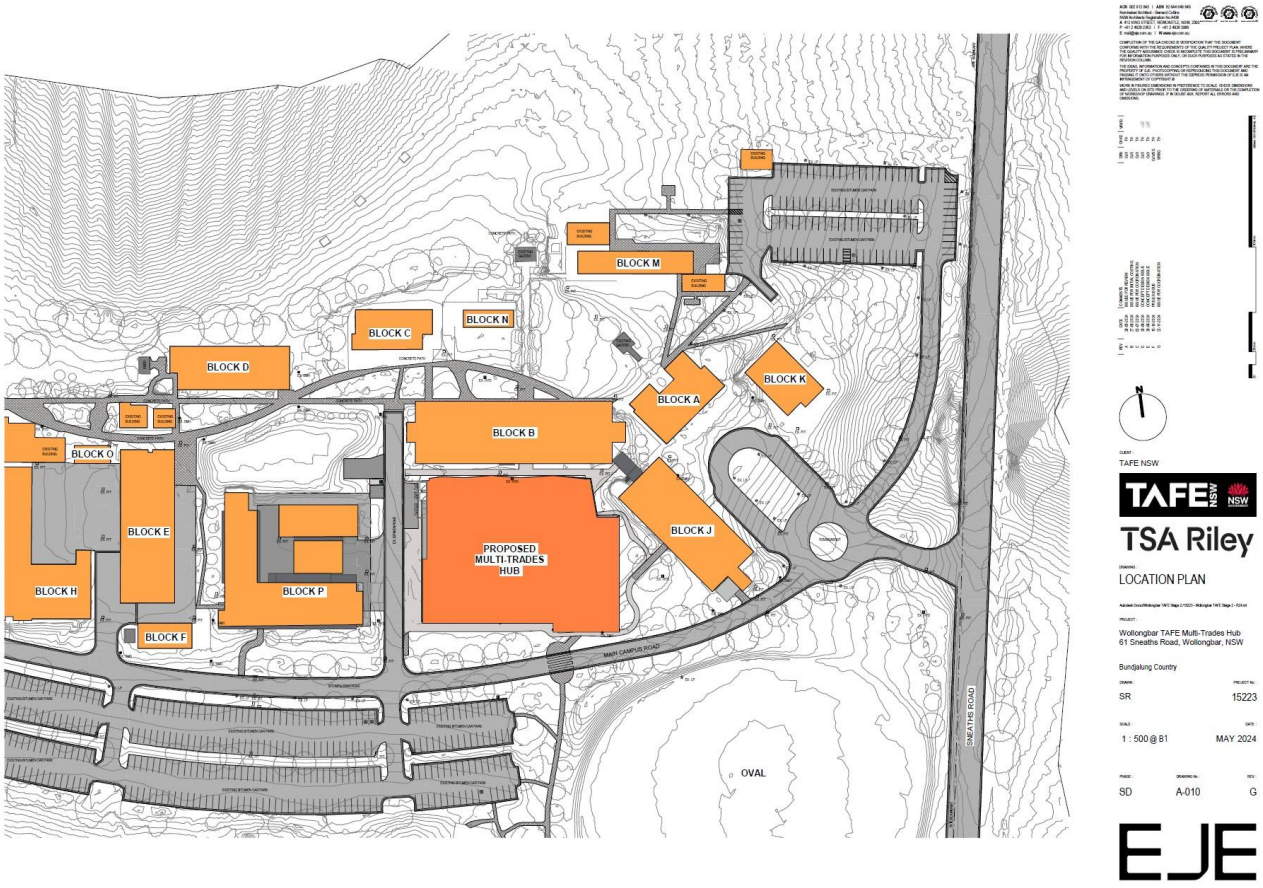


Figure 1-2 Location Plan (Source: EJE)

1.2 Assessment Objectives

The purpose of this acoustic assessment is to consider both onsite noise generation during construction and operation and to provide input regarding acoustic issues to consider during the schematic design stage of the project.

The outcomes of this assessment include recommendations for potential noise and vibration mitigation and management measures designed to achieve an acceptable noise amenity for residential (dwelling) occupants and other sensitive receivers surrounding the proposal site. Additionally, this assessment provides recommendations for the proposed development to achieve appropriate internal amenity guidelines.

1.3 Scope

The acoustic assessment scope of work included:

- Initial desk top review to identify noise sensitive receptors from aerial photography
- Undertake noise measurements to determine ambient and background noise levels
- Establish project noise goals for the construction and operation of the proposed project
- Identify the likely principal noise sources during construction, operation and their associated noise levels

- assessment of potential noise, vibration and sleep disturbance impacts associated with construction and operation aspects of the project
- Provide recommendations pertaining to internal and external building performance requirements for the proposed development to achieve appropriate internal amenity standards.
- provide recommendations for feasible and reasonable noise and vibration mitigation and management measures, where noise or vibration objectives may be exceeded.

1.4 Relevant Guidelines

The relevant policies and guidelines for noise and vibration assessments in NSW that have been considered during the preparation of this assessment include:

- Road Noise Policy (RNP, DECCW, 2011)
- Noise Policy for Industry (NPfI) (NSW EPA, 2017)
- Interim Construction Noise Guideline (ICNG) (NSW DECC, 2009)
- German Standard DIN 4150, Part 3: Structural Vibration in Buildings: Effects on Structures
- British Standard BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings
- Assessing Vibration: A Technical Guideline (DECC, 2006)

1.5 Limitations

The purpose of the report is to provide an independent acoustic assessment for the proposal.

It is not the intention of the assessment to cover every element of the acoustic environment, but rather to conduct the assessment with consideration to the prescribed work scope.

The findings of the assessment represent the findings apparent at the date and time of the assessment undertaken. It is the nature of environmental assessments that all variations in environmental conditions cannot be assessed and all uncertainty concerning the conditions of the ambient environment cannot be eliminated. Professional judgement must be exercised in the investigation and interpretation of observations.

In conducting this assessment and preparing the report, current guidelines for acoustics, noise and vibration were referred to. This work has been conducted in good faith with RAPT Consulting's understanding of the client's brief and the generally accepted consulting practice.

No other warranty, expressed or implied, is made as to the information and professional advice included in this report. It is not intended for other parties or other uses.

2. Existing Environment

2.1 Land Use

The site is zoned RU1 Primary Production. A map showing the land use zonings in the vicinity of the proposal are shown in Figure 2-1.

Figure 2-1 Land Use Zonings

To establish background and ambient noise levels, noise monitoring was undertaken by RAPT Consulting at the southern portion of the site in the vicinity of the proposed location of the multi trades hub from 29 June to 5 July 2024. Site observations noted the location is considered indicative of the local ambient noise environment and this site also presented as secure location whereby minimising the risk of theft or vandalism to the monitoring equipment. Additionally, they are considered as acceptable locations for determination of the background noise with consideration to the NSW Environment Protection Authority's (EPA's) – Noise Policy for Industry (NPfI). During site visits it was noted that distant road traffic and natural wildlife primarily described the ambient noise environment and is indicative of a rural noise environment.

The monitoring location is shown in Figure 2-2 and Figure 2-3.

Figure 2-2 Monitoring Location

Figure 2-3 Noise Monitoring Location

Monitoring was undertaken using a RION NL-52 noise logger with Type 1 Precision. Calibration was checked prior to and at the conclusion of the measurements with no significant drift. These loggers are capable of measuring continuous sound pressure levels and are able to record LAmin, LA90, LA10, LAmax and LAeq noise descriptors. The instrument was programmed to accumulate environmental noise data continuously over sampling periods of 15 minutes for the entire monitoring period.

The LA90 descriptor is used to measure the background noise level. This descriptor represents the noise level that is exceeded for 90 per cent of the time over a relevant period

of measurement. The LA90 descriptor is used to establish the Rating Background Noise Level (RBL), which is the overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period. The RBL has been calculated, according to the procedures described in the EPA's NPfI and by following the procedures and guidelines detailed in Australian Standard AS1055-1997, "Acoustics - Description and Measurement of Environmental Noise, Part 1 General Procedures."

The LAeq is the equivalent continuous noise level which would have the same total acoustic energy over the measurement period as the varying noise actually measured, so it is in effect an energy average.

Logged data was reviewed and filtered to exclude any extraneous data during the monitoring period. Weather information for the unattended noise logging was obtained from the Bureau of Meteorology Ballina Airport all weather station for the monitoring period and any data adversely affected by rain, wind (more than 5 m/s as per NPfI) were discarded.

The RBL and ambient LAeq levels are provided in Table 2-1 below.

Table 2-1 Background and Ambient Noise Monitoring Results

Location	Rating background level, L_{A90}, dB(A)			Ambient noise levels, L_{Aeq} dB(A)		
	Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
TAFE	37	36	32	55	47	47

Note 1 Day: 7:00 to 18:00 Monday to Saturday and 8:00 to 18:00 Sundays & Public Holidays ,Evening: 18:00 to 22:00 Monday to Sunday & Public Holidays , Night: 22:00 to 7:00 Monday to Saturday and 22:00 to 8:00 Sundays & Public Holidays

3. Acoustic Objectives

3.1 Construction Noise

Construction noise is assessed with consideration to DECCW *Interim Construction Noise Guidelines* (ICNG) (2009) The ICNG are non-mandatory guidelines that are usually referred to by local councils and other NSW government entities when construction / demolition works require development approval. The ICNG recommend standard hours for construction activity as detailed in Table 3-1.

Table 3-1 ICNG Recommended Construction Hours

Work type	Recommended standard hours of work
Normal construction	Monday to Friday: 7 am to 6 pm. Saturday: 8 am to 1 pm. No work on Sundays or Public Holidays.

The ICNG provides noise management levels for construction noise at residential and other potentially sensitive receivers. These management levels are to be calculated based on the adopted rating background level (RBL) at nearby locations, as shown in Table 3-2.

Table 3-2 Recommended Construction Noise Management Levels

Period	Management Level $L_{Aeq(15\ min)}$
Residential Recommended standard hours	Noise affected level: RBL + 10 Highly noise affected level: 75 dB(A)
Residential Outside recommended standard hours	Noise affected level: RBL + 5 Highly noise affected level: 75 dB(A)
Classrooms at schools and other educational institutions	Internal Noise Level 45 dB(A) (applies when properties are being used) Outdoor Noise Level 55 dB(A) (assumes 10dB(A) loss through an open window
Hospital wards and operating theatres	Internal Noise Level 45 dB(A) (applies when properties are being used)
Places of worship	Internal Noise Level 45 dB(A) (applies when properties are being used) Outdoor Noise Level 55 dB(A) (assumes 10dB(A) loss through an open window
Active recreation areas (characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion)	External noise level 65 dB(A)

Period	Management Level $L_{Aeq(15\ min)}$
Passive recreation areas (characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example, reading, meditation)	External noise level 60 dB(A)
Offices, retail outlets	70 dB(A)

The above levels apply at the boundary of the most affected residences / offices or within 30 m from the residence where the property boundary is more than 30 m from the residence.

The *noise affected level* represents the point above which there may be some community reaction to noise. Where the *noise affected level* is exceeded all feasible and reasonable work practices to minimise noise should be applied and all potentially impacted residents should be informed of the nature of the works, expected noise levels, duration of works and a method of contact. The *noise affected level* is the background noise level plus 10 dB(A) during recommended standard hours and the background noise level plus 5 dB(A) outside of recommended standard hours.

The *highly noise affected level* represents the point above which there may be strong community reaction to noise and is set at 75 dB(A). Where noise is above this level, the relevant authority may require respite periods by restricting the hours when the subject noisy activities can occur, considering:

- Times identified by the community when they are less sensitive to noise (such as mid-morning or mid-afternoon for works near residences).
- If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

It is understood most works required for the proposal would be undertaken during standard construction hours. However, construction noise management levels (NML's) for standard and out of hours situations are provided for completeness. NML's for residential receivers have been derived, as shown in Table 3-3.

Based on the above and the RBL's established from site monitoring construction noise management levels (NML's) for residential receivers have been derived, as shown in Table 3-3.

Table 3-3 Construction NML's dB(A) Leq(15min)

Period	RBL L_{A90}, dB(A)	Standard hours noise management levels, $L_{Aeq,15min}$, dB(A)	Out-of-hours noise management levels, $L_{Aeq,15min}$, dB(A)
Day[1]	37	47	42
Evening[1]	36	-	41
Night[1]	32	-	37

Note 2 Day: 7:00 to 18:00 Monday to Saturday and 8:00 to 18:00 Sundays & Public Holidays, Evening: 18:00 to 22:00 Monday to Sunday & Public Holidays , Night: 22:00 to 7:00 Monday to Saturday and 22:00 to 8:00 Sundays & Public Holidays

3.2 Construction Sleep Disturbance

The ICNG requires a sleep disturbance assessment to be undertaken where construction works are planned to extend over more than two consecutive nights. The ICNG makes reference to the EPA's NSW Environment Criteria for Road Traffic Noise (ECRTN), now superseded by the NSW RNP, for the assessment of sleep disturbance. The RNP references the recommendations in the ECRTN as providing the most appropriate assessment guidance.

The guidance provided in the RNP for assessing the potential for sleep disturbance recommends that to minimise the risk of sleep disturbance during the night-time period (10pm to 7am), the LA1(1 min) noise level outside a bedroom window should not exceed the LA90(15 min) background noise level by more than 15 dB(A). The EPA considers it appropriate to use this metric as a screening criterion to assess the likelihood of sleep disturbance. If this screening criterion is found to be exceeded, then a more detailed analysis must be undertaken that should include the extent that the maximum noise level exceeds the background noise level and the number of times this is likely to happen during the night-time period.

The RNP contains a review of research into sleep disturbance which represents NSW EPA advice on the subject of sleep disturbance due to noise events. It concludes that having considered the results of research to date that, 'Maximum internal noise levels below 50-55 dB(A) are unlikely to cause awakening reactions. Therefore, given that an open window provides around 10 dB(A) in noise attenuation from outside to inside, external noise levels of 60-65 dB(A) are unlikely to result in awakening reactions.

Construction is expected to take place during standard hours, and therefore sleep disturbance is not expected to be an issue. Additionally, the nearest residential receivers to the anticipated construction works are approximately 350 metres to the east and 450 metres southwest of the site. Therefore, sleep disturbance is not assessed further. However, sleep disturbance assessment levels are presented in Table 3-4.

Table 3-4 Construction Noise Sleep Disturbance Assessment Levels

Night-time rating background level, dB(A)	Sleep disturbance screening $L_{A1(1min)}$ criteria, dB(A)	Sleep disturbance awakening reaction $L_{A1(1min)}$ criteria, dB(A)
32	47	60

3.3 Vibration Guidelines

Vibration during construction and operational activity is expected to primarily originate from trucks and machinery during stages of construction and associated activities. RAPT Consulting also understand that blasting and heavy ground impact activities is not expected to occur during the construction works.

3.3.1 Human Exposure

Vibration goals during the were sourced from the DECCW's *Assessing Vibration: a technical guideline*, which is based on guidelines contained in British Standard (BS) 6472–1992, *Evaluation of human exposure to vibration in buildings (1–80 Hz)*.

Intermittent vibration is assessed using the vibration dose value (VDV), fully described in BS 6472 – 1992. Acceptable values of vibration dose are presented in Table 3-5.

Table 3-5 Acceptable Vibration Values for Intermittent Vibration ($m/s^{1.75}$)

Location	Daytime [1]		Night-time [1]	
	Preferred value	Maximum value	Preferred value	Maximum value
Critical areas [2]	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

3.4 Building Damage

Currently, there is no Australian Standard that sets the criteria for the assessment of building damage caused by vibration. Guidance of limiting vibration values is attained from reference to the following International Standards and Guidelines:

- British Standard BS7385.2 - 1993 *Evaluation and Measurement for Vibration in Buildings*, Part 2 - Guide to damage levels from ground borne vibration. and
- German Standard DIN 4150-3: 1999-02 *Structural Vibration – Part 3*: *Effects of vibration on structures*.

DIN 4150-3: 1999-02 is utilised in this case in the assessment of potential building damage resulting from ground borne vibration produced by the proposed activity.

The recommended Peak Particle Velocity (PPV) guidelines for the possibility of vibration induced building damage are derived from the minimum vibration levels above which any damage has previously been encountered and are presented in Table 3-6.

Table 3-6 Guideline values for vibration velocity to be used when evaluating the effects of short-term vibration on structures

Type of Structure	Peak Component Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of highest floor at all frequencies
	1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz*	
Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20-40	40-50	40
Dwellings and buildings of similar design and/or occupancy	5	5-15	15-20	15
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 of table 5-7 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

Ground Vibration – Minimum Working Distances from Sensitive Receivers

While this is not a transport project, the Transport for NSW *Construction Noise and Vibration Strategy* (CNVS) provides guidance for minimum working distances. As a guide, minimum working distances from sensitive receivers for typical items of vibration intensive plant are listed in Table 3-7. The minimum distances are quoted for both “cosmetic” damage (refer BS 7385) and human comfort (refer OH&E’s *Assessing Vibration - a technical guideline*). DIN 4150 has criteria of particular reference for heritage structures.

Table 3-7 Recommended Minimum Safe Working Distances for Vibration Intensive Plant from Sensitive Receiver

Plant Item	Rating / Description	Minimum Distance Cosmetic Damage		Minimum Distance Human Response (NSW EPA Guideline)
		Residential and Light Commercial (BS 7385)	Heritage Items (DIN 4150, Group 3)	
Vibratory Roller	<50 kN (1-2 tonne)	5m	11m	15m to 20m
	<100 kN (2-4 tonne)	6m	13m	20m
	<200 kN (4-6 tonne)	12m	15m	40m
	<300kN (7-13 tonne)	15m	31m	100m
	>300kN (13-18 tonne)	20m	40m	100m
	>300kN (>18 tonne)	25m	50m	100m
Small Hydraulic Hammer	300kg (5 to 12 t excavator)	2m	5m	7m
Medium Hydraulic Hammer	900kg (12 to 18 t excavator)	7m	15m	23m
Large Hydraulic Hammer	1600kg (18 to 34 t excavator)	22m	44m	73m
Vibratory Pile Driver	Sheet Piles	2m to 20m	5m to 40m	20m
Pile Boring	≤ 800mm	2m (nominal)	5m	4m
Jack Hammer	Hand Held	1m (nominal)	3m	2m

Unlike noise which travels through air, the transmission of vibration is highly dependent on substratum conditions between the source/s and receiver. Also dissimilar to noise travelling through air, vibration levels diminish quickly over distance, thus an adverse impact from vibration on the broader community is not typically expected. Vibration during works is considered an intermittent source associated with two main types of impact, disturbance at receivers and potential architectural/structural damage to buildings. Generally, if disturbance issues are controlled, there is limited potential for structural damage to buildings.

Contractors are recommended to use Table 3-7 as a guide when selecting plant given proximities to receivers.

3.5 Operational Noise

The NPfI doesn't contain specific procedures for the assessment of noise emissions from educational facilities. However, it is provided as a guide for determining potential noise impacts.

The New South Wales *Noise Policy for Industry* (NPfI) provides guidance on the assessment of operational noise impacts. The guidelines include both intrusive and amenity criteria that are designed to protect receivers from noise significantly louder than the background level and to limit the total noise level from all sources near a receiver.

Intrusive noise levels set by the NPfI control the relative audibility of operational noise compared to the background level. Amenity criteria limit the total level of extraneous noise. Both sets of criteria are calculated and the lower of the two in each time period normally apply. Intrusive criteria are simply 5 decibels above the measured (or adopted) background level with a minimum of 40 dB(A) for daytime and 35 dB(A) for evening and night time.

Amenity noise levels are determined based on the overall acoustic characteristics of the receiver area and the existing level of noise excluding other noises such as traffic and insects. Residential receiver areas are characterised into 'urban', 'suburban', 'rural' or other categories based on land uses, the existing level of noise from industry, commerce, and road traffic. Project amenity noise levels are the recommended amenity noise level (Table 2.1 of the NPfI) minus 5 dB(A) and plus 3 dB(A) to convert from a period level to a 15-minute level. The project noise trigger level is the lower value between the intrusive and the amenity noise levels.

Where cumulative industrial noise is not a necessary consideration because no other industries are present in the area, or likely to be introduced into the area in the future. In such cases the relevant amenity noise level is assigned as the project amenity noise level for the development which is the case in this situation.

The NPfI noise criteria are planning levels and are not mandatory limits required by legislation however the noise criteria assist the regulatory authorities to establish licensing conditions. Where noise criteria are predicted to be exceeded, feasible and reasonable noise mitigation strategies should be considered. In circumstances where noise criteria cannot be achieved negotiation is required to evaluate the economic, social and environmental costs and benefits of the development against the noise impacts.

The NPfI is generally intended for large and complex industrial sources and are not strictly applicable to educational developments. However, it is the most useful guideline policy for the assessment of plant and equipment noise impact to surrounding receivers. Therefore, the NPfI will be referred to as a yardstick for determining operational noise goals for this proposal.

Nearest residential receptors are considered Rural. It is understood the facility intends to operate generally during weekday daytime hours. Target noise levels are provided for residences, commercial premises, active recreation areas and classrooms in Table 3-8.

Table 3-8 Project Noise Trigger Levels dB(A)

	Day 7 am to 6 pm	Evening 6pm to 10pm	Night 10pm to 7am
Rating Background Level $L_{A90(Period)}$	37	36	32
Project Intrusive Noise Level, $L_{Aeq(15min)}$	42	41	37
Project Amenity Noise Level (Rural), $L_{Aeq(Period)}$	45	40	35
Project Amenity Noise Level $L_{Aeq(15min)}$	48	43	38
Project Trigger Level Residential $L_{Aeq(15min)}$	**42**	**41**	**37**
Commercial Premises (When in use) $L_{Aeq(15min)}$	**63**	**63**	**63**
Active Recreation (When in use) $L_{Aeq(15min)}$	**53**	**53**	**63**
School Classroom (External)* conversion of from internal to external for school classroom and assumes 10dB(A) loss from outside to inside through open window (Section 2.6 NPfI).	**43**	**43**	**43**

3.6 Road Noise Criteria

The NSW *Road Noise Policy* (RNP) recommends various criteria for different road and residential developments and uses. Although it is not mandatory to achieve the noise assessment criteria in the RNP, proponents will need to provide justification if it is not considered feasible or reasonable to achieve them. Based on the definitions in the RNP, the roads surrounding the proposal are local roads. The following noise goals provided in Table 3-9 Below.

Table 3-9 Road Noise Policy Goals

Road Category	Day	Night
Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use development	60 $L_{Aeq(15hr)}$ External	55 $L_{Aeq(9hr)}$ External
Existing residences affected by additional traffic on existing local roads generated by land use developments	55 $L_{Aeq(1\ hour)}$ (External)	50 $L_{Aeq(1\ hour)}$ (External)

For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding ‘no build option’.

4. Acoustic Assessment

4.1 Construction Noise

Construction can occur in the vicinity of residences or other sensitive land uses and be variable in times of occurrence. These aspects of construction can exacerbate noise levels and their effects. Construction noise by its nature is temporary, may not be amenable to purpose-built noise control measures applied to industrial processes, and may move as construction progresses. With these constraints in mind, the ICNG was developed to focus on applying a range of work practices most suited to minimise construction noise impacts, rather than focusing only on achieving numeric noise levels. While some noise from construction sites is inevitable, the aim of the Guideline is to protect much of residences and other sensitive land uses from noise pollution most of the time.

While it is unknown at this stage what specific plant and equipment are planned to be used, generally the typical construction activity on the proposal will be in the form of construction of the building. Other equipment may be used however it is anticipated that they would produce similar noise emissions. Therefore, an assumed construction sequence would be:

- Excavation/Site preparation.
- Construction of building.

Table 4-1 provides general plant and machinery data that has been used to predict noise levels at the neighbouring properties. The noisiest data has been chosen for each piece of plant/machinery to present a worst-case scenario.

Table 4-1 Plant and Equipment Noise Levels

Plant Item	Activity Noise Level L_{Aeq} @ 10m	DEFRA Construction Noise Database	Anticipated Usage %
Excavation			
Dozer	80	Table 2 Ref 10	50
Tracked Excavator	79	Table 2 Ref 14	50
Articulated Dump Truck	74	Table 2 Ref 32	50
Roller	73	Table 2 Ref 38	50
CFA Piling	79	Table 3 Ref 21	50
Building			
Concrete Pump & Cement Mixer	67	Table 4 Ref 24	50
Poker Vibrator	69	Table 4 Ref 34	50

Plant Item	Activity Noise Level L_{Aeq} @ 10m	DEFRA Construction Noise Database	Anticipated Usage %
Mobile Telescopic Crane	67	Table 4 Ref 36	50
Diesel Generator	61	Table 4 Ref 75	90

Note 3The sound power levels for the individual plant items are worst-case levels representative of the equipment operating at maximum capacity. In practice, not all plant items would operate at maximum capacity at the same time and therefore the estimated usage has been adjusted to reflect this. This adjustment is consistent with RAPT Consulting experience on similar projects.

It is understood the proposed work would be undertaken during standard work hours:

- Monday to Friday, 7am to 6pm
- Saturday, 8am to 1pm
- No works on public holidays.

Construction Operations

Acoustic modelling was undertaken using SoftNoise "Predictor" to predict the effects of construction noise. Predictor is a computer program for the calculation, assessment and prognosis of noise propagation. Predictor calculates environmental noise propagation according to ISO 9613-2, "Acoustics – Attenuation of sound during propagation outdoors". The method predicts the sound pressure level under meteorological conditions favourable to propagation from sources of known sound emission. These conditions are for downwind propagation or equivalently under a well developed moderate ground based temperature inversion. Terrain topography, ground absorption, atmospheric absorption and relevant shielding objects are taken into account in the calculations.

Construction noise levels have been predicted based on the potential construction noise levels provided in Table 4-1. These noise levels represent different equipment noise levels and give an idea how noise levels may change across the proposal area with different activities being undertaken.

The magnitude of off-site noise impact associated with construction would be dependent upon several factors:

- The intensity of construction activities
- The location of construction activities
- The type of equipment used
- Intervening terrain, and
- The prevailing weather conditions.

In addition, construction machinery would likely move about the study area, variously altering the directivity of the noise source with respect to individual receivers and their distances. Noise levels at sensitive receivers can be significantly lower than the worst-case scenario

when the construction works move to a more distant location in the work area. An example of this is shown in Figure 4-1.

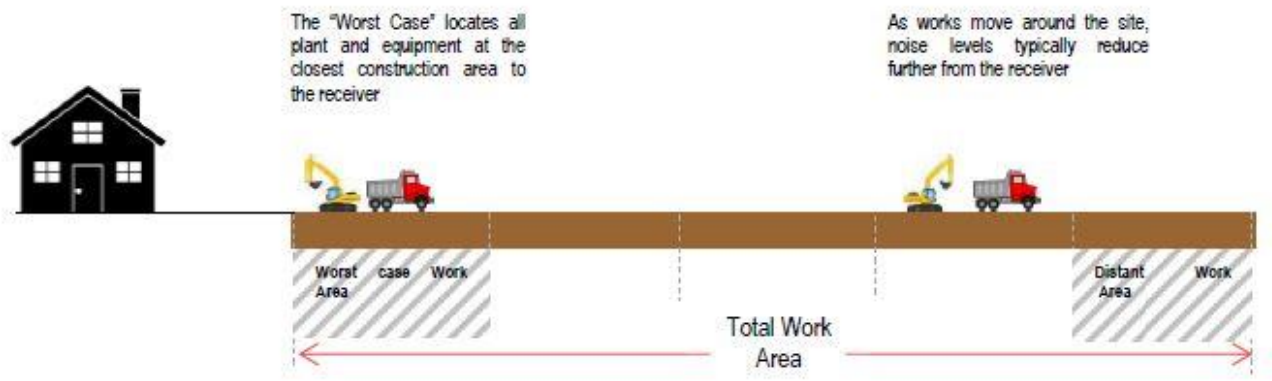


Figure 4-1 Example of Differing Work Areas

During any given period, the machinery items to be used in the study area would operate at maximum sound power levels for only brief stages. At other times, the machinery may produce lower sound levels while carrying out activities not requiring full power. It is highly unlikely that all construction equipment would be operating at their maximum sound power levels at any one time. Finally, certain types of construction machinery would be present in the study area for only brief periods during construction. Therefore, the modelled construction noise results are considered to represent a worst-case scenario. Two scenarios were assessed, one for the excavation and one for building.

Other key assumptions and inputs in the model include:

- topographical information was obtained from NSW Government Spatial Services
- all cleared areas were modelled considering a conservative ground factor of 0.5 to account for mixed surfaces
- all receivers were modelled at 1.5 metres above the ground surface

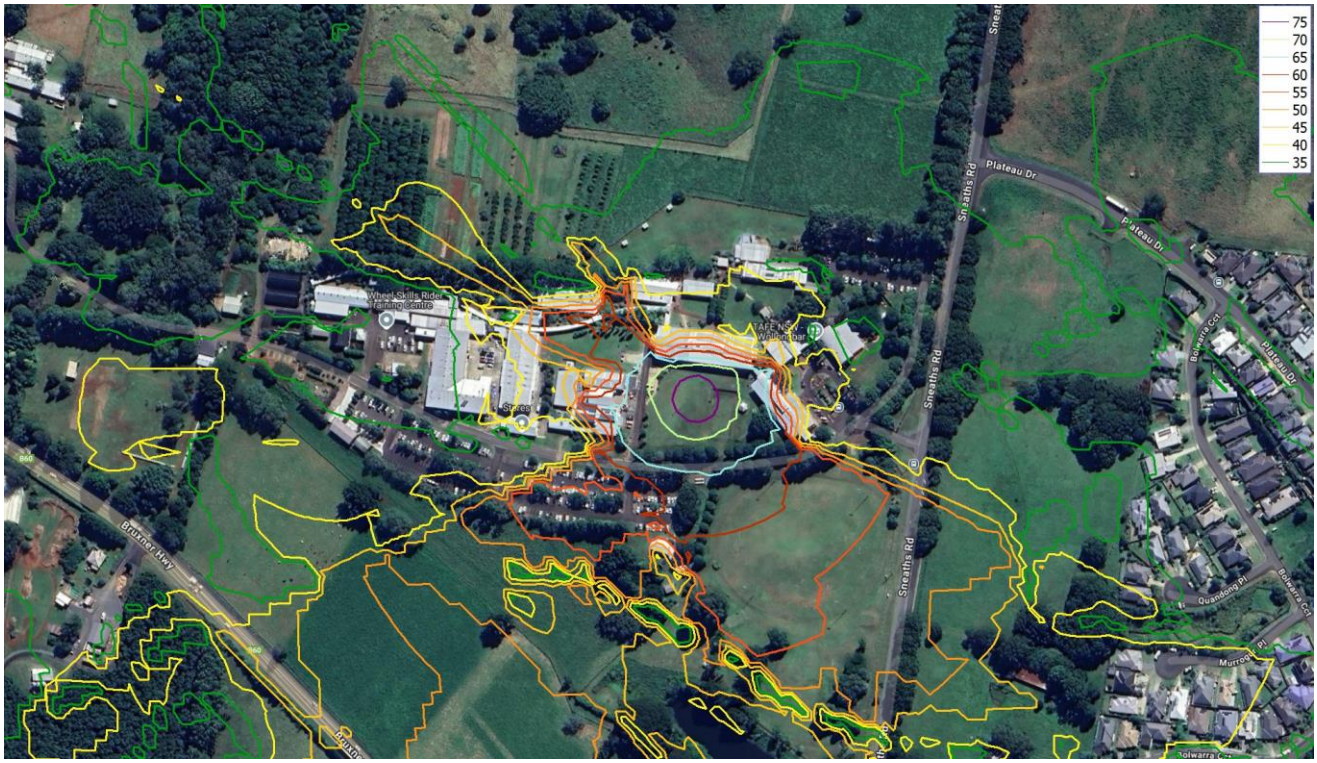


Figure 4-2 Excavation dB(A) Leq(15min)

Figure 4-3 Building Construction dB(A) Leq(15min)

The results of the construction assessment indicate exceedances of NML's has the potential to be exceeded particularly during excavation at nearest educational buildings. Residential receptors are expected to be complied with. However, the highly affected noise level is expected to be complied with in all cases. Assuming standard façade and glazing treatments would attenuate at least 20 dB(A), internal noise levels have the potential to be met in most

cases during excavation activities. Internal noise levels are expected to be met during building activities. While it is expected NML's can be achieved in most cases, there is a risk for NML's to be exceeded depending on work activities and locations. With this in mind it is recommended a construction noise management plan be implemented as part of the proposal to minimise the risk of adverse noise emanating upon the existing TAFE Campus and the broader community.

4.2 Construction Noise Management Plan

A Construction Noise Management Plan (CNMP) could be prepared prior to the commencement of works and implemented through all phases of the proposed construction works. The CNMP would provide the framework for the management of all potential noise impacts resulting from the construction works and would detail the environmental mitigation measures to be implemented throughout the construction works.

4.2.1 Planning and design of construction works

During the detailed planning, scheduling and design of the construction works the following noise management and mitigation measures should be investigated and, as required, implemented prior to the commencement of noise generating works.

Notification before and during construction

- Affected neighbours to the construction works would be advised in advance of the proposed construction period at least 1 week prior to the commencement of works.
- Consultation and communication between the site and neighbours to the site would assist in minimising uncertainty, misconceptions and adverse reactions to noise.
- All site workers (including subcontractors and temporary workforce) should be familiar with the potential for noise impacts upon residents and encouraged to take all practical and reasonable measures to minimise noise during their activities.
- The constructor or site supervisor (as appropriate) should provide a community liaison phone number and permanent site contact so that the noise related complaints, if any, can be received and addressed in a timely manner.
- The constructor (as appropriate) should establish contact with the residents and communicate, particularly when noisy activities are planned.

Best practice measures when operating on construction site

- Construction works should adopt Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA) practices as addressed in the ICNG. BMP includes factors discussed within this report and encouragement of a project objective to reduce noise emissions. BATEA practices involve incorporating the most advanced and affordable technology to minimise noise emissions.
- Ensure that all construction works scheduled for standard construction hours comply with the start and finish time.

- Where practical, simultaneous operation of dominant noise generating plant should be managed to reduce noise impacts, such as operating at different times or increase the distance between plant and the nearest identified receiver.

- High noise generating activities such as jack hammering should only be carried out in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block.

- Where possible, reversing beepers on mobile equipment would be replaced with low-pitch tonal beepers (quackers). Alternatives to reversing beepers include the use of spotters and designing the site to reduce the need for reversing may assist in minimising the use of reversing beepers.

- Equipment which is used intermittently should be shut down when not in use.

- All engine covers should be kept close while equipment is operating.

- The construction site would be arranged to minimise noise impacts by locating potentially noisy activities away from the nearest receivers wherever possible.

- To minimise heavy equipment handling noise, material stockpiles should be located as far as possible from the nearest receptors

- Loading and unloading areas should be located as far as possible from the nearest receptors.

- Where possible, trucks associated with the work area should not be left standing with their engine operating in a street adjacent to a residential area.

- All vehicular movements to and from the site should comply with the appropriate regulatory authority requirement for such activities.

Complaints handling

Noise and vibration monitoring should be undertaken upon receipt of a complaint to identify and quantify the issue and determine options to minimise impacts.

- If valid noise and/or vibration data for an activity is available for the complainant property, from works of a similar severity and location, it is not expected that monitoring will be repeated upon receipt of repeated complaints for these activities, except where vibration levels are believed to be potentially damaging to the building.

- Any noise and/or vibration monitoring should be undertaken by a qualified professional and with consideration to the relevant standards and guidelines. Attended noise and/or vibration monitoring should be undertaken upon receipt of a noise and/or vibration complaint. Monitoring should be undertaken and reported within a timely manner (say 3 to 5 working days). If exceedance is detected, the situation should be reviewed to identify means to reduce the impact to acceptable levels.

4.3 Construction Vibration

The relationship between vibration and the probability of causing human annoyance or damage to structures is complex. This complexity is mostly due to the magnitude of the

vibration source, the particular ground conditions between the source and receiver, the foundation-to-footing interaction and the large range of structures that exist in terms of design (e.g. dimensions, materials, type and quality of construction and footing conditions). The intensity, duration, frequency content and number of occurrences of vibration, are all important aspects in both the annoyances caused and the strains induced in structures.

Energy from construction equipment is transmitted into the ground and transformed into vibrations, which attenuates with distance. The magnitude and attenuation of ground vibration is dependent on the following:

- The efficiency of the energy transfer mechanism of the equipment (i.e. impulsive, reciprocating, rolling or rotating equipment).
- The Frequency content.
- The impact medium stiffness.
- The type of wave (surface or body).
- The ground type and topography.

Due to the above factors, there is inherent variability in ground vibration predictions without site-specific measurement data.

Ground Vibration – Minimum Working Distances from Sensitive Receivers

While this is not a transport project, the Transport for NSW CNVS provides guidance for minimum working distances. As a guide, minimum working distances from sensitive receivers for typical items of vibration intensive plant are listed in Table 4-2. The minimum distances are quoted for both "cosmetic" damage (refer BS 7385) and human comfort (refer DECC's Assessing Vibration - a technical guideline). DIN 4150 has criteria of particular reference for heritage structures. The minimum working distances are indicative and will vary depending on the particular item of plant and local geotechnical conditions. They apply to cosmetic damage of typical buildings under typical geotechnical conditions.

Table 4-2 Recommended Minimum Safe Working Distances for Vibration Intensive Plant from Sensitive Receiver

Plant Item	Rating / Description	Minimum Distance Cosmetic Damage		Minimum Distance Human Response (NSW EPA Guideline)
		Residential and Light Commercial (BS 7385)	Heritage Items (DIN 4150, Group 3)	
Vibratory Roller	<50 kN (1-2 tonne)	5m	11m	15m to 20m
	<100 kN (2-4 tonne)	6m	13m	20m

Plant Item	Rating / Description	Minimum Distance Cosmetic Damage		Minimum Distance Human Response (NSW EPA Guideline)
		Residential and Light Commercial (BS 7385)	Heritage Items (DIN 4150, Group 3)	
	<200 kN (4-6 tonne)	12m	15m	40m
	<300kN (7-13 tonne)	15m	31m	100m
	>300kN (13-18 tonne)	20m	40m	100m
	>300kN (>18 tonne)	25m	50m	100m
Small Hydraulic Hammer	300kg (5 to 12 t excavator)	2m	5m	7m
Medium Hydraulic Hammer	900kg (12 to 18 t excavator)	7m	15m	23m
Large Hydraulic Hammer	1600kg (18 to 34 t excavator)	22m	44m	73m
Vibratory Pile Driver	Sheet Piles	2m to 20m	5m to 40m	20m
Pile Boring	≤ 800mm	2m (nominal)	5m	4m
Jack Hammer	Hand Held	1m (nominal)	3m	2m

Contractors are recommended to use Table 4-2 as a guide when selecting plant given proximities to receivers.

4.4 Operational Noise

Noise modelling was also undertaken for operational noise. Key model set up input conditions were consistent with the construction noise assessment.

Modelling results are based on available information provided and should only be used as a guide for comparative purposes. Plant layout and building structures were based on information provided at the time of the assessment. Noise model setup are as outlined in section 4.1.

4.4.1 Noise Sources

Mechanical Plant

At this stage, the mechanical plant has not been selected for the development. However, it is not uncommon for the mechanical plant not to be selected prior to submitting a development application. Mechanical plant may consist of an air conditioning system and exhaust fans. A typical range of sound power levels for mechanical plant is given in Table 4-3 below.

Table 4-3 Typical Mechanical Plant Sound Power Levels

Plant Type	SWL dB(A)
Small (single fan) condenser	65
Medium (double fan) condenser	70
Large (double fan) condenser	80

A review of the existing schematic drawing set indicates two locations for rooftop plant. Therefore, For the purposes of this assessment it has been assumed the equivalent of one large double fan condenser is located in each of the two rooftop plant locations. The roof top plan is shown in Figure 4-4

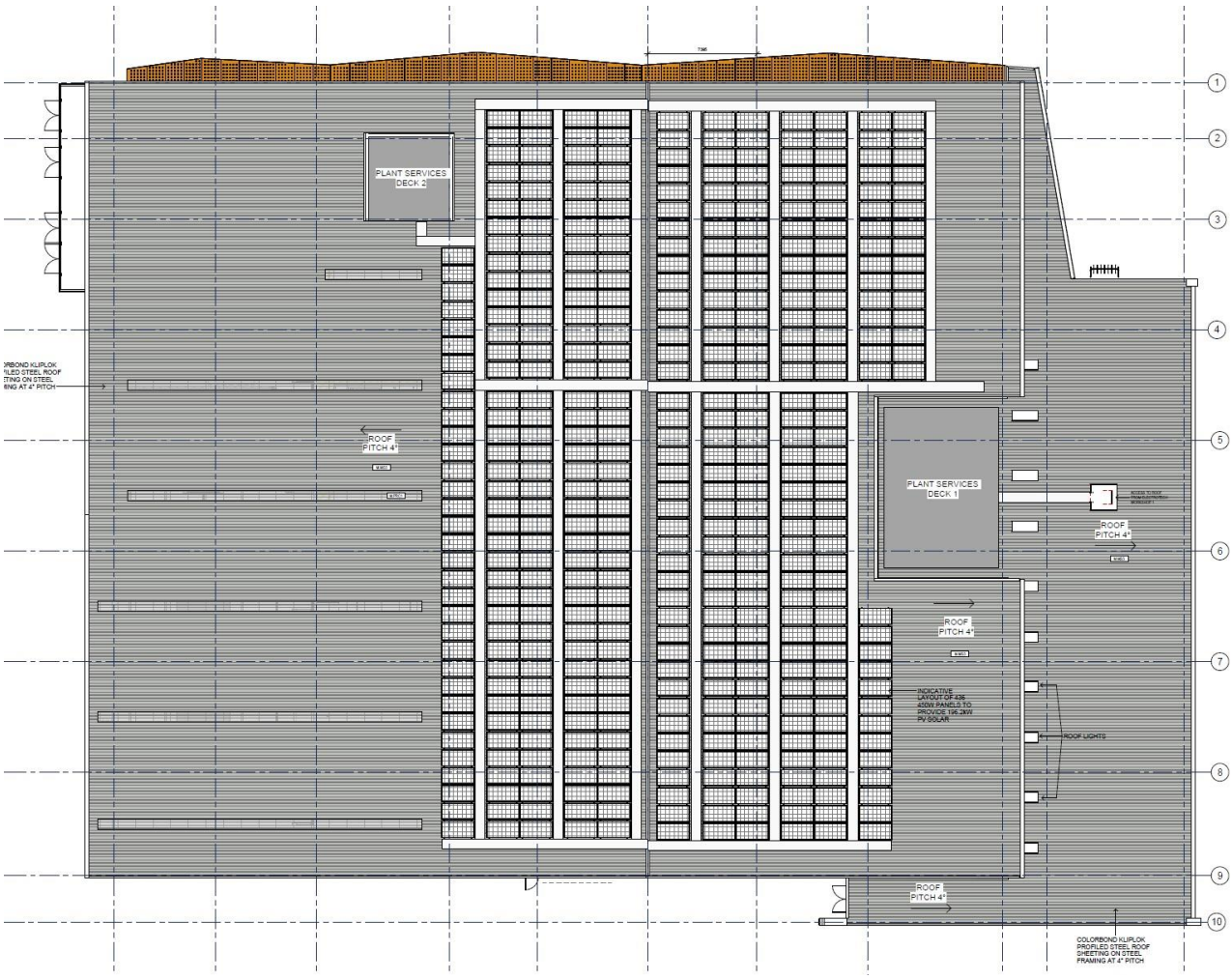


Figure 4-4 Rooftop Plan (Source: EJE)

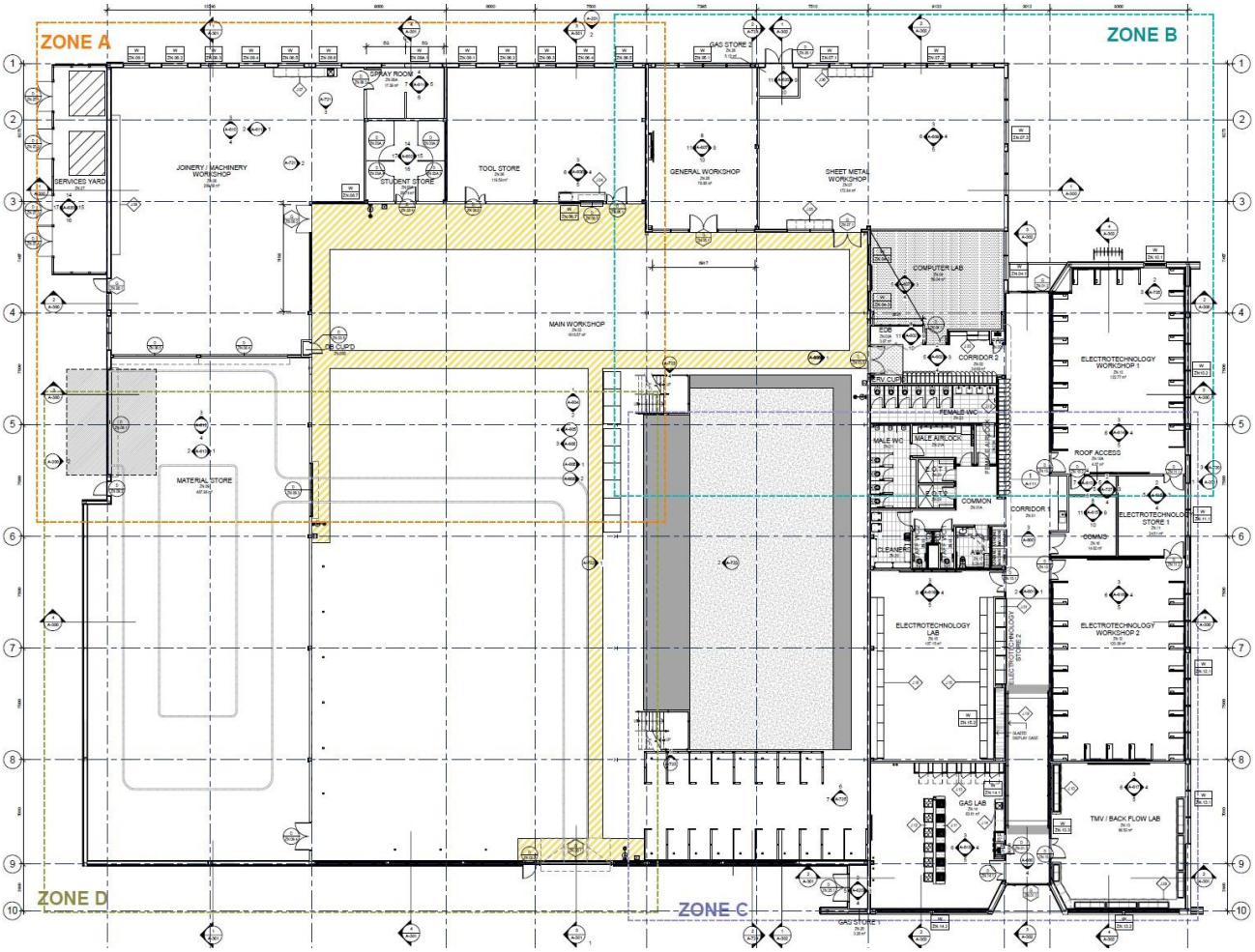
Industrial Noise

RAPT Consulting has undertaken numerous measurements of carpentry items. The items modelled are shown in Table 4-4. Other items may be used however they are expected to emit similar if not lower sound levels as angle grinding and hammer drilling emit particularly high sound levels to represent a reasonable worst case scenario. These items have been assumed to be operating 50% of the time as RAPT Consultings' experience with workshop situations is that not all items are used full time. Rather intermittently. Therefore 50% is deemed to be a conservative assumption.

Table 4-4 Modelled Plant Items

	Octave Band Centre Frequency, Hz dB(A)								
	31.5	**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
Drop Saw	25	44	48	65	77	83	88	95	88
Angle Grinder	51	58	65	71	82	91	95	103	100
Hammer Drill	29	52	76	84	98	106	104	99	86

These noise sources or other similar items are expected to primarily be taking place in the northern section of the building in the Joinery / Machinery Workshop, The General Workshop, Main Workshop and The Sheet Metal Workshop. The locations are shown in the overall reference plan provided in Figure 4-5.



Noise emissions from other locations in the building would be expected to be much lower as it is not expected highly noise generating activities as outlined in Table 4-4 would be occurring in places such as the computer lab, stores, electrotechnology workshops and electrotechnology lab.

Therefore in these other locations SafeWork NSW noise exposure standards have been conservatively utilised as noise source levels in the other locations in the building.

SafeWork NSW refers to exposure standards for occupational noise from The NSW Work Health and Safety Regulation Chapter 4 Part 4.1 Clause 56 which states:

In this Regulation, ***exposure standard for noise***, in relation to a person, means:

- $L_{Aeq,8h}$ of 85 dB(A), or
- $L_{C,peak}$ of 140 dB(C).

$L_{Aeq,8h}$ means the eight-hour equivalent continuous A-weighted sound pressure level in decibels (dB(A)) referenced to 20 micropascals, determined in accordance with AS/NZS 1269.1:2005 *(Occupational noise management—Measurement and assessment of noise immission and exposure)*.

$L_{C,peak}$ means the C-weighted peak sound pressure level in decibels (dB(C)) referenced to 20 micropascals, determined in accordance with AS/NZS 1269.1:2005 *(Occupational noise management—Measurement and assessment of noise immission and exposure)*.

Based on Safe Work NSW exposure standards, a conservative internal noise level of 85 dB(A) has been adopted for this assessment for the remainder of the building. Based on the provided intended use of these other spaces, this is considered a conservative approach as internal noise levels would be expected be much lower for the anticipated usages.

4.4.2 Building Components

Based on a review of the provided schematic drawing set the building may be constructed of 1mm corrugated Steel, minimum R2.5 130mm Rock Wool and 12mm BC Grade plywood or 13mm impact resistant plasterboard. Glazing has been assumed to be Rw 45 VLam Hush Double Glazing.

The sound reduction applied in the assessment for these building elements is provided in Table 4-5.

Table 4-5 Building Element Sound Reductions

	Octave Band Centre Frequency, Hz								
	31.5	**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
VLam Hush	14	25	30	38	44	44	47	63	63
1mm Corrugated Steel, 130mm Rock Wool, 13mm Plasterboard	11	16	21	32	42	47	52	61	61

The results of the assessment are shown in Figure 4-4.

Figure 4-5 Operational Noise dB(A) Leq(15min)

Discussion

The results of the operational assessment indicate operational noise will comply with project noise trigger levels at all residential receptors during day, evening, and night time.

However based on the results of the assessment there is potential for noise levels to be exceeded by up to 5 dB(A) at nearest TAFE Buildings Particularly Block B if their window were open. With Block B windows closed, achievement of noise goals can be expected.

The plant items utilised are viewed as a reasonable worst case particularly for the hammer drill and angle grinder. It is not expected these items would be utilised often in the mult-trades hub. As an example, most items in a multi trades building would emit similar sound levels as the drop saw as shown in Table 4-6 and therefore received noise levels could be expected to be much less than what was presented.

Table 4-6 Measured Workshop Plant Items

Plant Item	Measured Sound Level at 1 metre dB(A)
Drop Saw	97
Planer	94
Circular Saw	96
Plunge Router	92
Jig Saw	92

Additionally RAPT Consulting has undertaken numerous noise surveys of fabrication shops and generally LAeq(15min) noise levels are lower than 85 dB(A) within the building depending on location of measurement and items being measured.

While this assessment represents what is considered a reasonable worst case scenario, it is recommended that external facades of Rw55 and Glazing of minimum Rw45 be investigated and implemented during the design development of this project. By implementing these minimum design requirements, it is expected that noise emanating from the proposed multi trades hub can be minimised and achieve environmental noise goals particularly for nearest TAFE Buildings.

Road Traffic Noise

For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'. This would equate to a 60% increase in overall traffic volumes which is not expected. The overall increase in traffic volumes is expected to be negligible and comply with noise objectives.

5. Conclusion

This environmental acoustic assessment has been undertaken for EJE Architecture as part of the TAFE Wollongbar Stage 2 Project. The site is located at 61 Sneaths Road Wollongbar, NSW.

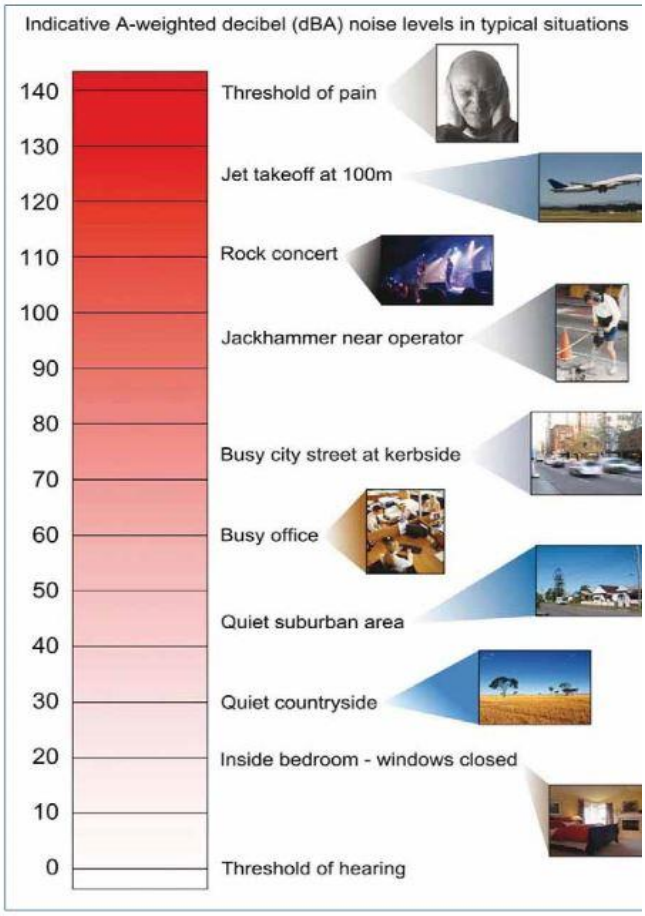
Construction

The assessment outlined in this report indicates that construction noise management levels have the potential to be exceeded in some situations. However, the highly noise affected level of 75dB(A) $L_{Aeq(15min)}$ is expected to be complied with. A set of standard mitigation measures for construction noise and vibration have been provided based on anticipated requirements of the proposal. It is believed construction noise can be minimised and managed to be acceptable to the local community through the implementation of a CNMP similar to what has been recommended in this report.

Operation

The result of the environmental assessments indicates in a reasonable worst case situation noise levels have the potential to be exceeded at nearest TAFE Buildings should their windows be open. While actual received noise levels can be expected to be lower than what was presented in the report, external façade recommendations have been made to minimise noise emanating from the new multi trades hub to comply with established environmental project noise trigger levels.

Glossary of Acoustic Terms

Term	Definition
dB	Decibel is the unit used for expressing the sound pressure level (SPL) or power level (SWL) in acoustics. The picture below indicates typical noise levels from common noise sources. 
dB(A)	Frequency weighting filter used to measure 'A-weighted' sound pressure levels, which conforms approximately to the human ear response, as our hearing is less sensitive at very low and very high frequencies.
$L_{Aeq(period)}$	Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.
$L_{A10(period)}$	The sound pressure level that is exceeded for 10% of the measurement period.
$L_{A90(period)}$	The sound pressure level that is exceeded for 90% of the measurement period.
L_{Amax}	The maximum sound level recorded during the measurement period.
Noise sensitive receiver	An area or place potentially affected by noise which includes:

	A residential dwelling. An educational institution, library, childcare centre or kindergarten. A hospital, surgery or other medical institution. An active (e.g. sports field, golf course) or passive (e.g. national park) recreational area. Commercial or industrial premises. A place of worship.
Rating Background Level (RBL)	The overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period.
Feasible and Reasonable (Noise Policy for Industry Definition)	**Feasible** mitigation measure is a noise mitigation measure that can be engineered and is practical to build and/or implement, given project constraints such as safety, maintenance and reliability requirements. Selecting **Reasonable** measures from those that are feasible involves judging whether the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the mitigation measure. To make a judgement, consider the following: Noise impacts Noise mitigation benefits Cost effectiveness of noise mitigation Community views.
Sound power level (SWL)	The sound power level of a noise source is the sound energy emitted by the source. Notated as SWL, sound power levels are typically presented in dB(A).
DnT,w	Weighted Standardised Level Difference A single number rating of the sound level difference between two rooms. DnT,w is typically used to measure the on-site sound insulation performance of a building element such as a wall, floor or ceiling
Dw	Weighted Sound Level Difference A single number rating of the sound level difference between two rooms. Dw is typically used to measure the on-site sound insulation performance of a building element such as a wall, floor or ceiling
Impact sound	Sound produced by an object impacting directly on a building structure, such as footfall noise or chairs scrapping on a floor
L'nT,w	Weighted, Standardised Impact Sound Pressure Level A single number rating of the impact sound insulation of a floor/ceiling when impacted on by a standard 'tapper' machine. L'nT,w is measured on site. The lower the L'nT,w, the better the acoustic performance.
Lw (or SWL)	Sound Power Level. The level of total sound power radiated by a sound source.
Masking Noise	Intentional background noise that is not disturbing, but due to its presence causes other unwanted noises to be less intelligible, noticeable and distracting.

NRC	Noise Reduction Coefficient A single number rating between 0 and 1 of the ability of a material to absorb sound. It is the average of the absorption coefficients in the 250-2000Hz octave bands rounded to the nearest 0.05. The larger the number, the more absorptive the material.
Octave Band	Octave Band A range of frequencies where the highest frequency included is twice the lowest frequency. Octave bands are referred to by their logarithmic centre frequencies, these being 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, and 16 kHz for the audible range of sound.
Room Criterion (RC)	The Room Criteria (RC) Method is a HVAC related background noise acceptability rating method. The RC method is a family of criterion curves (specifying sound levels by octave bands) intended to establish HVAC system design goals and a rating procedure.
RT or T60	Reverberation Time The time (in seconds) taken for the sound pressure level generated by a particular noise incident to decay by 60 decibels following the conclusion of the noise event (hence T60 abbreviation). Reverberation Time is used for assessing the acoustic qualities of a space, describing how quickly sound decays within a space. The reverberation time is related to the room volume and total absorption.
Rw	Weighted Sound Reduction Index A single number rating of the sound insulation performance of a specific building element. Rw is measured in a laboratory. Rw is commonly used by manufacturers to describe the sound insulation performance of building elements such as plasterboard and concrete.
Speech transmission	(STI) is a measure for the transmission quality of speech with respect to intelligibility. A value of 0 indicates completely unintelligible speech while a value of 1 indicates perfectly intelligible speech.

TAFE Wollongbar

Multi-Trades Hub

Tafe NSW

Traffic Impact Assessment

April 2025

SECAsolution

TAFE Wollongbar

Multi-Trades Hub

Traffic Impact Assessment

Author: Cathy Thomas
Client: TAFE NSW c/- EJE Architecture
Issue: Ver04/ 4.04.2025
Reference: P2843
4 April 2025

Quality Review and Document History

Version	Date	Description	Prepared By	Reviewed / Approved
Ver01	7/12/24	Draft	C. Thomas	S. Morgan
Ver02	28/1/25	Final for review	C.Thomas	S.Morgan
Ver03	16/2/25	Final for issue	C.Thomas	S/Morgan
Ver04	4/4/25	Final updated re student numbers	C.Thomas	S.Morgan

Newcastle NSW 2300 Ph: (02) 4032-7979

PO Box 570, Toronto NSW 2283

www.secasolution.com.au

© Seca Solution Pty Ltd 2025
The information contained in this document is confidential and intended solely for the use of the client for the purpose for which it has been prepared. Use or copying of this document in whole or in part without the written permission of Seca Solution constitutes an infringement of copyright. The intellectual property contained in this document remains the property of Seca Solution.

Contents

Contents i

1. Introduction 1

2. Existing Situation 3

2.1 Site Description and Proposed Activity 3
2.2 Site Location 3
2.3 Site Access 4
2.4 Traffic Flows 6
2.5 Parking Supply and Demand 11
2.6 Public Transport 13
2.7 Other Proposed Developments 14

3. Proposed Development 15

3.1 The Development 15
3.2 Access 15
3.3 Circulation 16
3.4 Parking 17

4. Transportation Analysis 19

4.1 Traffic Generation 19
4.2 Traffic Distribution and Assignment 20
4.3 Impact on Road Safety 21
4.4 Impact of Generated Traffic 22
4.5 Public Transport 23
4.6 Pedestrian and Cyclists 23

5. Summary and Recommendations 24

Appendix A Site Plan 26

Appendix B Bruxner Highway Upgrade Preferred Corridor 28

Appendix C Traffic Data 29

Appendix D Trip Distribution 31

Appendix E Development Traffic Data 33

Appendix F SIDRA Analysis and SIDRA Outputs 37

Appendix G TAFE Wollongbar Due Diligence Traffic Study (ptc 2023) 376

Quality Traffic Advice

1. Introduction

1.1 Background

Seca Solution Pty Ltd has been commissioned by EJE Architecture on behalf of TAFE NSW to prepare a traffic and parking assessment for the proposed expansion of the Wollongbar TAFE to complement the existing TAFE facilities in this location. The updated facilities will be provided within the TAFE grounds and shall see the demolition of underutilised/outdated facilities. There is no change proposed to the existing car parking within the campus.

As part of the project, Seca Solution staff has collected traffic data at the TAFE entry and have observed the traffic operations in the locality of the site during the critical AM peak period. A parking beat survey of the campus has also been undertaken to determine the parking demands across the site.

This report has been prepared taking into consideration the modelling undertaken in the Due Diligence Assessment prepared by ptc in June 2023 which undertook data collection and SIDRA intersection modelling of the intersections of Sneaths Road and the Campus Access as well as the roundabout of Lismore Road plus the intersection of Sneaths Road and the Bruxner Highway. Seca Solution has not undertaken further modelling having reviewed the findings of the Due Diligence report and considered it appropriate for this project.

1.2 Scope of Report

The scope of this report is to determine the suitability of the local road network to accommodate the additional demands associated with the expansion and the suitability of the existing TAFE parking to provide for the changes proposed. This assessment has included a review of the external traffic movements associated with the proposed development and a review of the parking demands. The report provides advice on the capacity of key intersections, as well as the impacts on the operation of the internal carparks and vehicle circulation.

1.3 Issues and Objectives of the study

The issues relative to the proposal are:

- Assess impact on the local road network due to the additional traffic flows;
- Assess the impact of the additional parking generated by the proposed development;
- Review the access arrangements for the development;
- Review the service arrangement for the development; and
- Assess any other transport impacts associated with the development.

The objective of the report is to document the impacts of the proposed development and provide advice on any infrastructure work required as part of the development.

1.4 Planning Context

In preparing this document, the following guides and publications were used:

- State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP (T&I))
- Guide to Transport Impact Assessments Transport for NSW November 2024
- Ballina Development Control Plan 2012
- Australian / New Zealand Standard – Parking Facilities Part 1: off-street car parking (AS2890.1:2004)
- TAFE Wollongbar Due Diligence Traffic Impact Assessment – PTC June 2023 (ptc)
- Bruxner Highway – Wollongbar to Goonellabah Road Upgrade Investigations Transport for NSW

Quality Traffic Advice

1.5 State Environmental Planning Policy (Transport and Infrastructure) 2021

Sec 3.12 - a TAFE **is not defined** as a school for the purpose of a specified development requiring review by Transport for NSW as the specified authority.

For the purpose of Sec 3.58 the development will provide for the relocation of the Cabinet Making course from Casino TAFE being an additional 36 students and will provide modern, updated learning facilities for existing students at Wollongbar TAFE. This **does not see an increase in student numbers of 50** or more and so is not deemed a Traffic Generating Development.

Per Schedule 3 of the SEPP (T&I) the project would be classified as a development being "any other purpose".

The project site is located more than 90 metres from the Bruxner Highway (State Classified Road) so Column 2 is applicable.

It is the impact of the *additional* traffic that is to be assessed. "If the development involves an enlargement or extension of existing premises, the relevant size or capacity specified in the table is the additional (rather than the total) size or capacity of the premises as a result of the enlargement or extension. (SEPP)"

Per Traffic Generation Chapter 4.1 determined for the tested scenario that the maximum load for the Multi-Trades Hub would see 64 Driver Vehicles and 14 drop off vehicles in the AM peak. These have been considered *additional* demands over the existing situation. The actual peak hour increase in traffic will however be much less being for the additional staff and students not already catered for in classes run on the campus.

Therefore, as the project would not generate 200 or more vehicles per hour this development **would not be considered a traffic generating development** for the purpose of the SEPP (T&I).

2. Existing Situation

2.1 Site Description and Proposed Activity

TAFE NSW Wollongbar (TAFE) is located between Lismore and Ballina in northern New South Wales. The subject site is located off Sneaths Road with the Bruxner Highway along the southern boundary of the TAFE. No direct access is provided to the highway.

The proposed Multi-Trades Hub shall complement the existing TAFE facilities located on campus with the expansion expected to cater for an increase in enrolments with the potential for an additional 216 students and 14 staff on campus on a busy day.

2.2 Site Location

The site is located off Sneaths Road, Wollongbar, as shown below in Figure 2-1.

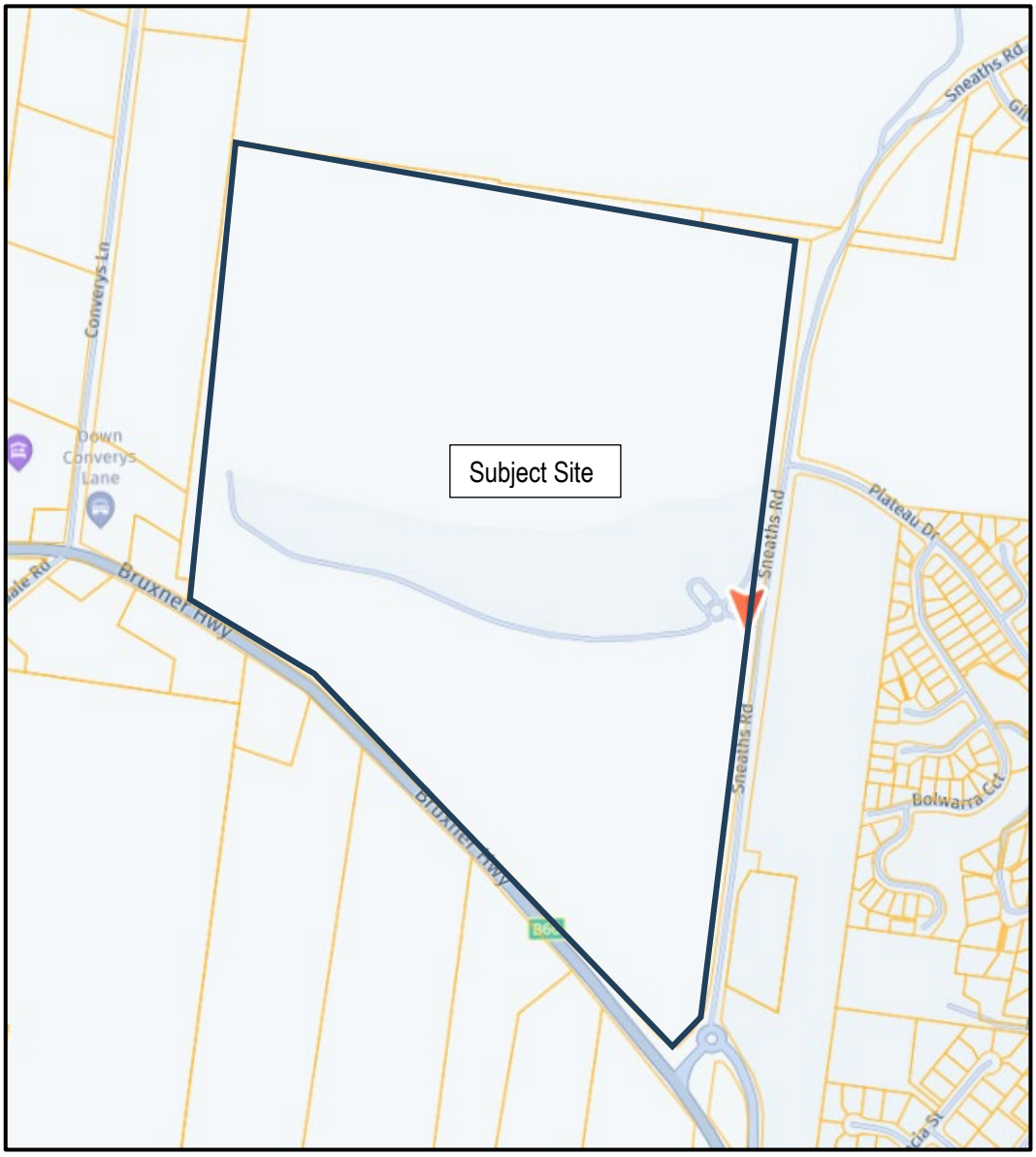


Figure 2-1: Site Location (Source:NEARMAP)

Quality Traffic Advice

2.2.1 Zoning and Adjacent Land Use

Land uses in proximity to the TAFE is primarily rural landholdings with a residential development on the eastern side of Sneaths Road.

2.3 Site Access

Access to the TAFE is available via a short length of roadway off Sneaths Road. This provides a T-intersection with channelised turn lanes and is Stop sign controlled allowing Sneaths Road priority. Carparking within the TAFE is accessed via several internal roadways which intersect at a single lane roundabout within the site providing for all turn movements.

The various buildings within the TAFE are accessed from a network of internal footpaths.

2.3.1 Road Hierarchy

2.3.1.1 Bruxner Highway

The main arterial road through Wollongbar is the Bruxner Highway, which is part of the state road network under the care and control of Transport for NSW (TfNSW). The Bruxner Highway provides a mix of single and two lane carriageways with a divided carriageway to the east of the site. To the west of the site the highway reduces to two lanes of travel with sealed shoulders. At major intersections auxiliary lanes are provided to cater for left and right turning movements which at Sneaths Road is provided with a dedicated right turn lane to enable outbound vehicles to turn across eastbound traffic only.

Figure 2-2 Bruxner Highway and Sneaths Road interchange

Pedestrians are not catered for on the highway given the remote location however there are sealed shoulders provide space for cyclists. Street lights at the Sneaths Road interchange provide a high level of illumination for night time safety. It carries high volumes of traffic, including heavy vehicles, consistent with its role as a state classified road.

2.3.1.2 Sneaths Road

Sneaths Road is a local road running in a north-south direction which provides access to the rural areas to the north as well as the residential area of Wollongbar to the east of the TAFE. In the vicinity of the site, it provides a single lane of travel with narrow sealed shoulders. It operates under the posted speed limit of 60km/hr.

There is no lighting in the vicinity of the TAFE nor kerb and guttering however there is a shared pathway which runs along the eastern side of Sneaths Road.

Bus services operate along Sneaths Road.

2.3.2 Roadworks and Traffic Management Plans

A review of the Ballina Shire Council website indicates that there are currently no road upgrades planned in the immediate vicinity of the site.

Transport for NSW has carried out investigations to secure a future corridor for a dual carriage road alignment for the highway west of Wollongbar (being Sneaths Road) (**Appendix B**).

The investigations were to ensure a future upgrade could:

- provide a major high speed movement corridor with no at-grade intersections (where local roads intersect with a highway at the same elevation) from Sneaths Road to Oliver Avenue
- tie into the Alstonville Bypass to provide a consistent road environment, being a high-speed arterial road corridor
- bring the alignment up to current safety design standards
- identify opportunities for shared pathways and active transport connections, including along the existing Bruxner Highway alignment
- be designed for B-double and oversize overmass vehicles.

The implementation of these upgrades are however deferred until further funding is secured.

2.3.3 Pedestrian and Cycling Facilities

Pedestrian footpaths are provided throughout the TAFE Campus allowing for adequate connection between parking areas and Campus facilities. Pedestrian crossings are provided across the campus ensuring that pedestrian movements can be safely managed and controlled given the low-speed environment. There is no footpath connection between the TAFE campus and Sneaths Road.

There is a shared pathway on the eastern side of Sneaths Road and other local roads in the area are identified as being “bike friendly roads” which is consistent with observations of local traffic demands.

The Ballina Shire Cycleway and Shared Path brochure identifies a 1.4km link between Wollongbar Village and Alstonville to the east.

Quality Traffic Advice

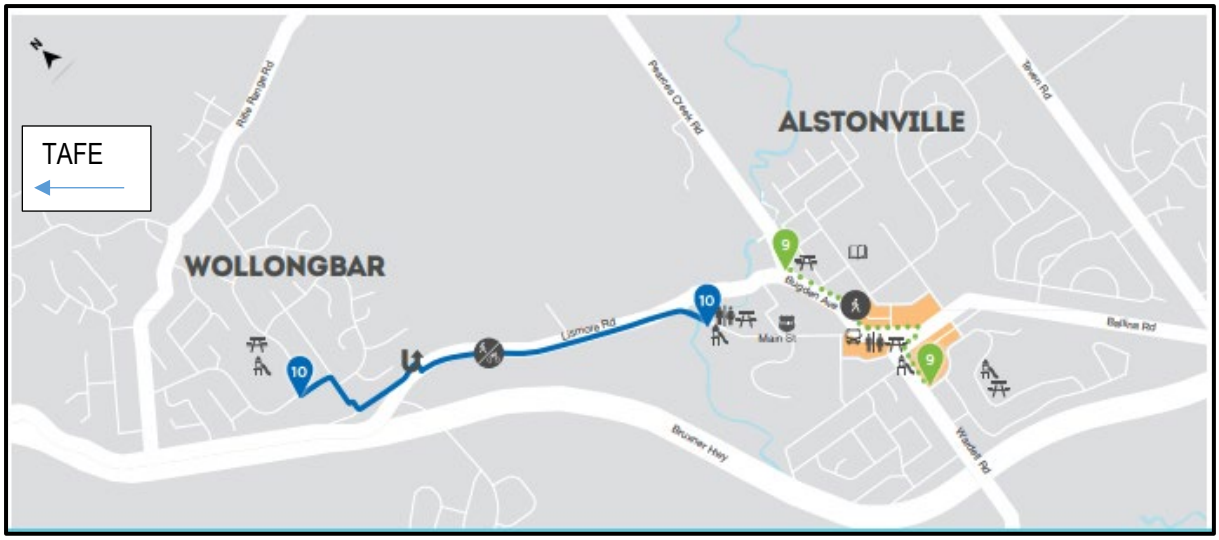


Figure 2-3: Alstonville to Wollongbar Village Map (Source: Ballina Shire Council)

2.4 Traffic Flows

2.4.1 Peak Hour Flows

2.4.1.1 Sneaths Road and TAFE Access

As part of the project work Seca Solution undertook traffic surveys at the intersection of Sneaths Road and the TAFE Access to determine the current traffic flows in this location. A traffic survey was undertaken by Seca Solution staff in the morning of Tuesday 18th June 2024 between 6.30am-9.30am, with the peak hour determined as 7:15am to 8:15am. This count was undertaken based on information from the TAFE that this day was representative of a busy day on site. The AM period was determined as the critical period based on experience at other similar campuses where it is evident that the majority of staff and course arrivals occur in the morning with the pattern of departure being spread across a range of times, depending upon course length, later in the day.

A summary of the AM peak hour flows is shown below in Figure 2-4.

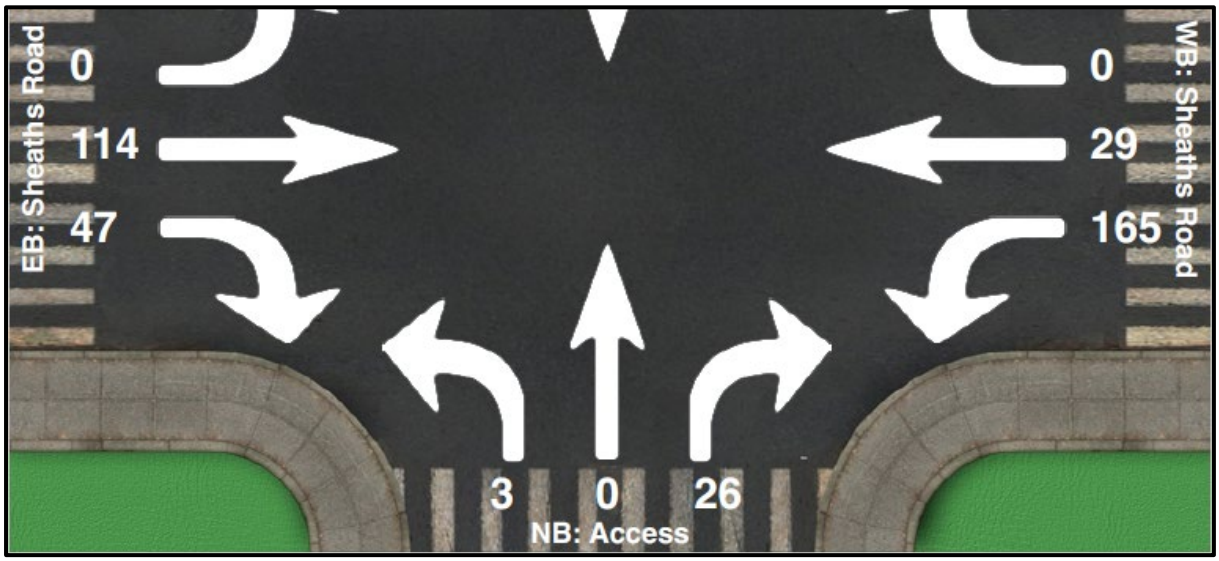


Figure 2-4 AM Peak hour flows at the site entry on Sneaths Road (7.15-8.15AM)

It can be seen that through traffic demands are low with two way demands north of the Campus Access being 193 vehicles per hour (vph). The main demand is for left turns into the campus from the south.

Allowing for these mid-flow demands, Sneaths Road operates at a Level of Service of A, being less than 200 vph per direction.

The intersection access with the TAFE has been designed with left and right turn lanes off Sneaths Road being a 60 and 65m storage lane plus taper.

Figure 2-5 Intersection of Sneaths Road and TAFE Access

The access road provides a single travel lane in each direction with flaring onto Sneaths Road to accommodate the swept paths of larger vehicles, including buses.

In the afternoon this may see some delays for exiting motorists with the main demand being for right turning vehicles out of the TAFE. These delays are expected to clear quickly given the low demand for opposing traffic on Sneaths Road being less than 120 vph northbound or 1 vehicle each 30 seconds, based on the assumption that afternoon flows would be of similar magnitude as the AM peak with the reverse directional flows.

Quality Traffic Advice

Photo 1 Sneaths Road looking south showing left turn lane into the TAFE

Photo 2 Exit onto Sneaths Road from the TAFE

Internal traffic counts were also undertaken to confirm the allocation of traffic to the carparks north and south within the campus.

Table 2-1 Traffic distribution within the campus

Direction of travel	vph
Left turn towards southern parking	167
Straight ahead towards Port Cochere	16
Right turn towards northern carparks	29

These movements are dispersed throughout the campus and the various parking lots with the road layout (one lane of travel in each direction) suitable to cater for these flows. The existing traffic control and pedestrian infrastructure provided on campus allows for these internal vehicle movements across the campus to occur safely.

Speed control devices to the north carparks were however noted as needing repairs with cars observed to drive around the half speed humps, crossing to the other side of the road.

2.4.2 Daily Traffic Flows

Peak hour flows in urban environments typically equate to 8-12% of daily traffic flows.

Allowing for the peak hour flows on Sneaths Road to represent 10% of the daily flows, flows on this road south of the TAFE access would be in the order of 3,400 vpd.

2.4.3 Daily Traffic Flow Distribution

The daily traffic volumes are reasonably balanced on Sneaths Road. There is a bias in through movements southbound in the morning peak period with the reverse likely in the afternoon however the inbound (northbound) demands towards the TAFE in the morning and outbound (southbound) in the afternoon impacts this flow pattern.

2.4.4 Vehicle Speeds

No speed surveys were completed as part of the study work. The campus has a 30km/h posted speed limit with traffic calming (vertical speed control) devices located to reinforce this.

2.4.5 Heavy Vehicle Flows

Observations during the traffic surveys indicate there are minimal heavy vehicle movements in the vicinity with the main demand being for local bus services.

There is a bus stop located within the TAFE grounds which sees buses entering and leaving the campus access.

2.4.6 Current Road Network Operation

Observations on site during the peak periods shows that traffic movements in the vicinity of the campus generally operate well.

SIDRA outputs prepared by ptc (Figure 2-8) indicates that the intersections, including the campus access, operate well with minimal delays and queuing on all approaches during the peak hours providing an overall level of service A.

Quality Traffic Advice

Table 10 - SIDRA Output - Existing Traffic Volumes

Intersection	Period	Scenario	LoS	DoS (v/c)	AD (sec)	Q95 (m)
1.Bruxner Highway / Sneaths Road	AM Peak	Existing	A	0.853	5.9	61.2
		Background growth	A	0.985	10.1	114.3
		Future	A	1.036	13.7	114.3
	PM Peak	Existing	A	0.707	4.6	39.6
		Background growth	A	0.794	5.2	50.0
		Future	A	0.899	7.2	80.7
2. Sneaths Road / Lismore Road	AM Peak	Existing	A	0.317	6.0	12.3
		Background growth	A	0.317	6.0	12.3
		Future	A	0.356	5.9	30.2
	PM Peak	Existing	A	0.312	6.9	12.6
		Background growth	A	0.312	6.9	12.6
		Future	A	0.427	7.2	16.8
3. Sneaths Road / TAFE Wollongbar Campus Entrance	AM Peak	Existing	A	0.084	4.0	1.4
		Background growth	A	0.084	4.0	1.4
		Future	A	0.118	4.5	2.1
	PM Peak	Existing	A	0.301	5.2	10.2
		Background growth	A	0.301	5.2	10.2
		Future	A	0.414	5.6	15.8

Figure 2-6 Table 10 excerpt from TAFE Wollongbar Due Diligence Traffic Report (ptc 2023)

2.4.7 Traffic Safety and Accident History

The roads in the vicinity of the subject site are well laid out, with good forward visibility on all approaches. It is considered that the road network in the vicinity of the site provides a safe overall layout and ensures that there are no road safety concerns. A review of crash data (transport.nsw.gov.au/roadsafety/statistics) for the five-year period 2019-2023 shows there have been no collisions at the intersection of Sneaths Road and the TAFE Access.

There have been six accidents at the intersection of Sneaths Road and the Bruxner Highway with one in 2020 resulting in serious injury.

Reporting year	Crash Id	Degree of crash	RUM - code	RUM - description	Type of location	Natural lighting	Longitude	Latitude	Number killed	Number injured
2020	1227115	Serious Injury	13	Right near	T-junction	Daylight	153.411373	-28.821541		2
2021	1278844	Moderate Injury	13	Right near	T-junction	Daylight	153.411373	-28.821541		1
2022	1288467	Non-casualty (towaway)	21	Right through	T-junction	Daylight	153.411373	-28.821541		
2022	1291146	Non-casualty (towaway)	13	Right near	T-junction	Daylight	153.411373	-28.821541		
2023	1324168	Minor/Other Injury	10	Cross traffic	T-junction	Daylight	153.411373	-28.821541		1
2023	1344280	Moderate Injury	10	Cross traffic	T-junction	Daylight	153.411373	-28.821541		2

Figure 2-7 Extract from Crash Data at the intersection of Sneaths Road and the Bruxner Highway.

Given the high volume of traffic this data indicates that this intersection is operating at an adequate level of safety.

There was also a crash (2022) involving a right rear incident to the north of the roundabout of Sneaths Road and Lismore Road which resulted in a serious injury.

2.5 Parking Supply and Demand

2.5.1 On-street Parking Provision

There is no on street parking provided along Sneaths Road with narrow sealed shoulders and grassed verges allowing for vehicles to pull off only if necessary.

2.5.2 Off-Street Parking Provision

Seca Solution undertook a parking survey of the main parking areas throughout the Wollongbar TAFE in order to understand the peak parking demands for a typical weekday. This survey was undertaken on Tuesday 18th June 2024 with a count undertaken at 6.30am and again at 9.30am to confirm the parking load. The results of this survey are outlined to follow in Table 2-2 below.

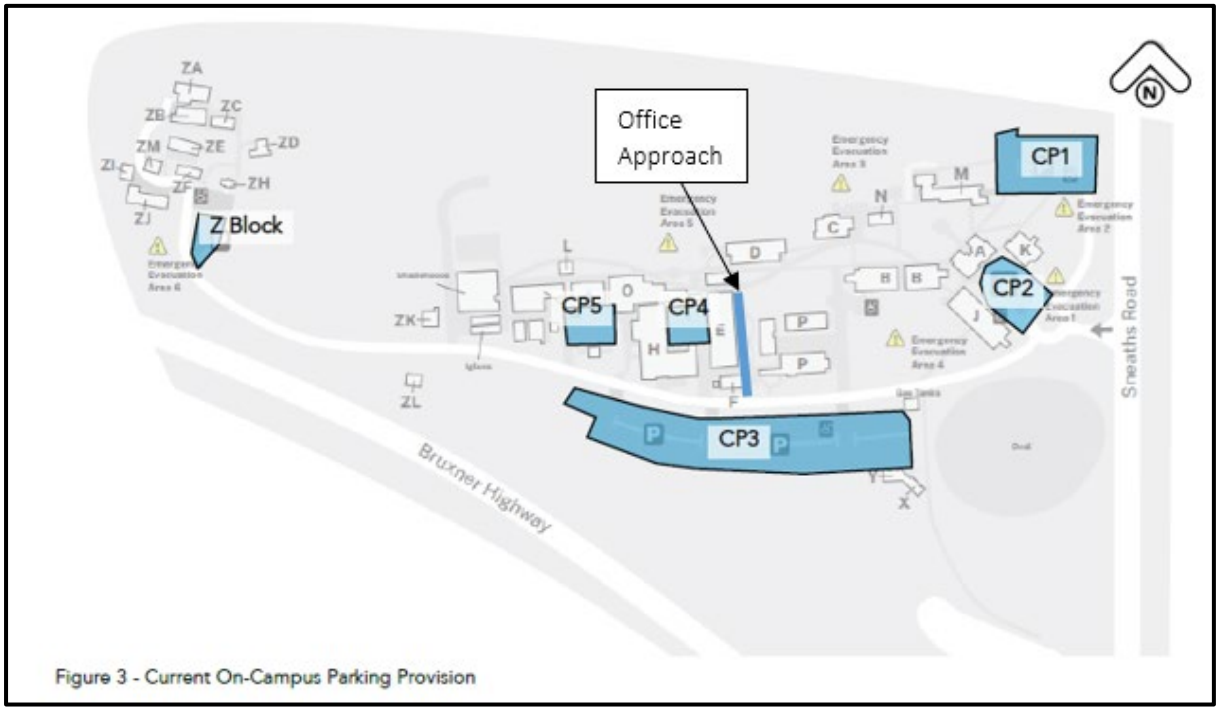


Figure 2-8: Parking beat survey areas

Quality Traffic Advice

2.5.3 Parking Demand and Utilisation

The survey results found there was parking available on site throughout the day, with the vast majority of vacant spaces recorded in the main car park (CP3).

Table 2-2: Parking beat survey results

Parking Areas	SECA Solution Parking Survey 9.30am			
	Available	Occupied	Vacant	% Vacant
CP1	112	77	35	
CP2	13	13	-	
CP3	332	210	122	
CP4 #	6	6	nil	
CP5	22	18	4	
Z block	35	16	19	
Office approach Short term	10	4 + (2 inf)	6	
Totals	530	344 + (2 inf)	184	35%

Observations on site indicate this parking is used by the vehicle workshop for the storage of cars used as resources for various courses. A review of campus parking on 29th December 2023 showed 13 vehicles stored in this area when the rest of the campus was empty, being closed for Christmas break. Based on the travel surveys undertaken by ptc some staff and students do nominate this as an area they park in (approx. 6). This was therefore included as representing parking demands in this location.

Based on the above the available parking capacity for staff and students has therefore been determined as being in the order of 530 spaces.

As a comparison a count of vacant spaces for CP1, CP2, CP3, CP5 and the approach to the office area was undertaken using Nearmap dated aerial imagery. Capacity for these parking areas was 489 spaces. Z Block was not included due to the tree cover in this area.

Table 2-3 Additional parking demands (Source: Nearmap)

	CP1 **112**	**CP2** **13**	**CP3** **332**	**CP3 Fleet**	**CP5** **22**	**Office** **10**	**Total Vacant**	**% vacant**
Monday 13th May 2024 Mid-morning	8	2	105	13	4	3	135	27%
Wednesday 14th February 2023 – Late morning	43	2	94	15	9	5	168	34%
Wednesday 16th November 2022 Mid-morning	51	1	118	16	5	7	198	40%

NB Friday 17th March 2023 had less than 20% occupancy so was not included in the above as being representative

The average vacancy rate across these three samples is 34% which is consistent with the physical count undertaken on site.

Based on this it is evident that the overall site has an oversupply of parking with average parking demands of less than 70%.

Applying the rate from Monday 13th May 2023 (27% vacancy) to reflect the highest parking demand this would represent an availability of parking of at least **135 spaces that would be available for use by the future expansion.**

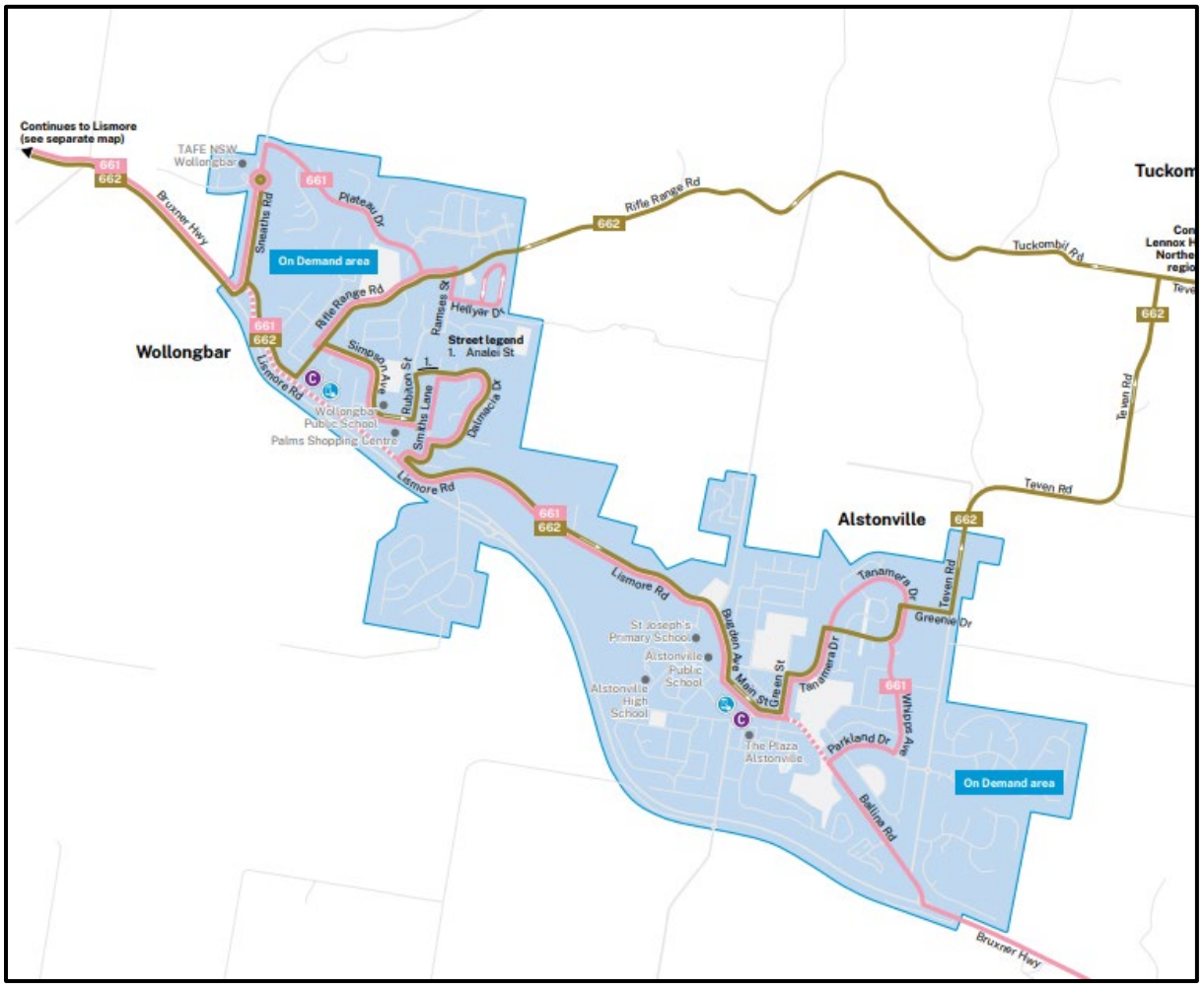
2.6 Public Transport

2.6.1 Rail Station Locations

Wollongbar is not serviced by trains with the closest train station at Casino, 47kms west of the area. This is located on the North Coast Line which provides services from Sydney to Brisbane, through a number of regional areas. There are 3 daily services in each direction.

2.6.2 Bus Routes and Associated Facilities

Bus services are provided by Buslines with Route 661 operating regularly between Lismore and Ballina via the TAFE and Route 662 Lennox Head to Lismore with two daily services.



Route 661 Wollongbar TAFE, Sneaths Rd, Wollongbar (Ballina to Lismore)

- Arrivals: 07:29 08:10 09:44 10:39 11:39 12:39 13:34 15:06 15:55 16:25 17:33

Route 661 Wollongbar TAFE, Sneaths Rd, Wollongbar (Lismore to Ballina)

- Arrivals: 06:50 07:45 08:25 09:00 10:33 11:40 12:40 13:40 14:40 16:10 17:50

Quality Traffic Advice

Lennox Head to Alstonville/ Wollongbar/ Lismore & Return									ROUTE 662
Monday to Friday No Services Operate Saturday, Sunday & Public Holidays									
		♿	♿			♿		♿	
		SD	SH			SD		SH	
	LENNOX HEAD TO LISMORE	am	am		**LISMORE TO LENNOX HEAD**	pm		pm	
109	Lennox Head Bus Zone - Ballina Street	7.30	7.30	**1**	Spinks Park Transit Centre	3.25		3.25	
	Tintenbar Store - Tintenbar Road	7.45	7.45	**2**	Lismore Square	3.30		3.30	
	Teven Road Cnr Eltham Road	7.50	7.50	**3**	Lismore Base Hospital	3.38		3.38	
50	Alstonville Main Stop		8.00	**4**	Southern Cross University-p/u Ballina Rd/Kellas St	3.40		3.40	
	Wollongbar - Lismore Rd / Rifle Range	8.05	8.05	**4**	Ballina Road / Kellas Street	3.40		3.40	
40	Wollongbar TAFE	If Required	8.07	**33**	Goonellabah - 2LM	3.45		3.45	
33	Goonellabah - 2LM	8.10	8.15	**40**	Wollongbar TAFE	3.57		3.57	
4	Ballina Road / Kellas Street	8.13	8.30	**48**	Wollongbar- Simpson & Smiths Lane	4.04		4.04	
4	Southern Cross University-drop Kellas St/Ballina Rd	8.13	8.30	**50**	Alstonville Main Stop	4.10		4.10	
3	Lismore Base Hospital	If Required	8.33		Teven Road Cnr Eltham Road	4.20		4.20	
2	Lismore Square		8.35		Tintenbar Store - Tintenbar Road	4.23		4.23	
1	Spinks Park Transit Centre	8.30	8.38	**109**	Lennox Head Bus Zone - Ballina Street	4.35		4.35	

There is a bus stop within the TAFE grounds at which some staff and students were observed alighting buses during the survey period.

This bus stop also operates as a bus interchange with parents observed dropping school children from various primary and high schools to wait and join available services. It is assumed that the same would happen in the afternoon with parents picking up children returning from their school. This demand is unrelated to the operation of the TAFE.

Photo 3 Bus services stop within the roundabout to service the bus stop in this location

.

2.7 Other Proposed Developments

A review of aerial images indicates there are several pockets of development occurring within the Wollongbar Village but to the east of the township. Traffic associated with these shan't be high and is unlikely to impact in the vicinity of the TAFE.

Other areas of development may occur in conjunction with Flood Relief Strategies however this is subject to future planning.

3. Proposed Development

3.1 The Development

The proposed development involves the expansion of the existing TAFE Wollongbar Campus to provide for the construction of a new Multi-Trades Hub to allow for the existing trades courses on site to be housed in updated, more purpose-built teaching facilities and to accommodate the transfer of the Cabinet Marking course from Casino TAFE.

The development is proposed to accommodate a demand for up to 550 enrolments across a week and associated staff. These do not all attend site daily but rather will see a maximum of 216 students and 12 teachers on site based on occupations of 18 students per space plus a teacher. According to the number of desks/benches/workstations available, there is a maximum of 12 spaces that can be occupied concurrently. Allowing for the current planning for the campus this maximum usage may occur on Wednesdays during semester 1, where 12 spaces would potentially be occupied at the same time. At other times the cumulative demands for the building are likely to be lower.

Whilst a portion of these students, up to 36 allowing for two classes, will be additional to the campus, the majority are a relocation of students from outdated facilities within the campus. Whilst these students are existing on campus, to provide a robust assessment they have been treated as additional for this assessment (tested scenario).

Allowing for 2 additional full-time staff members occupying the Material Store and Tool Store, the total maximum occupants for the Multi-Trades Hub would be 216 students and 14 staff on site at any one time.

The concept plans for the proposed development are provided in **Appendix A.**

3.1.1 Phasing and Timing

Pending approval, the development is expected to see classes commence between mid-2026 and the start of 2027.

3.1.2 Design vehicles for access and circulation requirements

The majority of additional traffic accessing the site will be light vehicles associated with staff and students. There will be a requirement for some heavy vehicles to access the Multi-Trades Hub building, associated with material deliveries. The existing internal roads are adequate to cater for service and delivery vehicles, as per the current situation.

3.2 Access

3.2.1 Access Location

The building is being located to the north of the existing main roadway through the campus with the building fronting a north-south driveway to the west.

3.2.2 Service Vehicle Access

Service vehicles will use the existing road network and be able to load material deliveries and waste through the front of the building. This service and materials handling area has been designed for the specific requirements of the trade hub.

3.2.3 Queuing at entrances

3.2.3.1 Site Access

Observations during the traffic surveys indicate that there are negligible delays for traffic turning in or out of the site at the start of the day with no delays for through traffic at the site entry.

Quality Traffic Advice

It is anticipated there could be some minor delays for vehicles turning out of the campus during the evening peak however these queues are contained within the site and do not impact the operation of the local roads. The additional traffic generated by the proposed development may see some increase to queuing however this would depend upon the timing for the end of classes which are typically staggered and would not impact the flow of inbound traffic into the site. These queues will see a minimal increase and are expected to clear the site quickly.

Queues may occur when all staff are leaving at the end of the day and could be exacerbated if a bus is stopped at the bus stop within the site, particularly of this impacts the ability for vehicles to traverse the roundabout. A review of the bus timetable shows that services are due at this stop at 3.55pm, 4.10pm, 4.25pm and 5.33pm which could coincide with outgoing TAFE traffic.

As the bus stop is used as a bus interchange it is anticipated that in the afternoon there would also be some traffic associated with the pickup of commuters, including school children, which being both inbound and outbound could add to the traffic demands at the TAFE site exit. It is unclear the degree to which these commuter pick ups impact congestion at the internal roundabout however it is anticipated that some delays could occur for outbound TAFE traffic if vehicles stop to load passengers near the bus stop, within the roundabout. These demands however are beyond the control of Wollongbar TAFE.

3.2.3.2 Service Access

Within the site there are no vehicle queues expected associated with the proposed loading bay areas. The service driveway terminates to the north of the site with a turn bay which caters for bin collection but also truck turning. In the unlikely event a vehicle is required to hold on this driveway, there is good visibility on the approach from either the north or the south to allow an oncoming vehicle to adjust speed accordingly. The existing low speed limit ensures a safe road environment.

3.2.4 Access to Public Transport

The existing pedestrian facilities on campus shall be extended to connect with the new building.

3.3 Circulation

3.3.1 Pattern of circulation

The pattern of circulation across the site will remain the same as the existing arrangements. There is no change proposed to the existing roads or circulation through carparks.

3.3.2 Internal Road width

There are no changes proposed to the internal roads for the campus.

3.3.3 Internal Bus Movements

There will be no changes to internal bus movements on campus as a result of this development, with buses to continue to access the bus stop located near the campus entry within the site.

3.3.4 Service Area Layout

A loading area shall be provided on the western side of the new Multi-Trades Hub building, adjacent to the internal storage area. Details of the operation and management of this area will be incorporated into the campuses operational plan of management.

Photo 4 Internal roadway with subject site to right of photo

3.4 Parking

3.4.1 Proposed Supply

There are no significant changes proposed to the carpark as a whole.

Four short term parking spaces shall be removed and two accessible spaces relocated opposite to allow for the service area adjacent to the building's western frontage.

3.4.2 Council code and local parking policies and plans

Ballina DCP provides a parking rate for Educational Establishments (Tertiary) of 1 space per 5 students and 2 per employees.

3.4.3 Parking Layout

The site layout will allow for the safe parking of vehicles within the site, as per the current situation.

3.4.4 Projected demand

Applying the DCP rates to the proposed development, which may generate a daily peak load of 216 students and 14 teachers, the new Multi-Trades Hub would provide a requirement for **51 carparking spaces on the campus.**

Table 3-1: Parking Assessment for Multi-Trade Hub

Situation	Number of Spaces
Available parking at peak parking demand (27% vacancy)	135 spaces
Additional parking demand associated with proposal	-51 spaces
Net loss of parking associated with the Multi-Trades Hub	-4 spaces
Net available parking supply	80 spaces

Based on this it can be seen there is available parking across the campus to cater for the development of the Multi-Trades Hub, with 80 spaces still remaining unused allowing for the application of the parking demands per the DCP. This makes no concession for the existing students on site.

Quality Traffic Advice

3.4.5 Service Vehicle Parking

The loading area on the western side of the new building will provide sufficient area for a service vehicle to park while unloading into the adjacent storage area.

3.4.6 Pedestrian and Bicycle Facilities

The new building shall include pedestrian infrastructure linking the building to existing paths on site.

End of trip facilities, including showers and change rooms are provided to cater for cyclists.

4. Transportation Analysis

4.1 Traffic Generation

The Guide to Transport Impact Assessments does not specify a trip generation rate for this type of development.

Traffic generation has been determined by ptc for the Due Diligence Assessment which allowed for an increase in enrolments of 500 places with up to 185 students (37% of enrolments) on site across a day and 22 staff (Figure 4-1).

Future Traffic Volumes for Increased Student Number

The future scenario assumes a student increase of 500 and staff increase of 27 (see Table 6). The calculation of the additional traffic volumes is shown in Table 8 and Table 9.

Table 8 - Future Additional Traffic Volumes for Increased Student and Staff Number

Period	Difference	% arriving per day	# attending during AM/PM peak	% travelling by car	Car Occupancy	No. of Total Vehicles
Students						
AM	500	37%	39%	91%	1.1	60
PM			51%	92%		79
Staff						
AM	27	81%	73%	99%	1.05	15
PM			51%	100%		11

Table 9 - Split of Future Additional Traffic Volumes

Period	Additional No. of Total Vehicles	% Drop-off / Pick-up	No. Drop-off / Pick-up Vehicles	No. Drivers' Vehicles
AM	75	18%	14	61
PM	90	17%	16	74

Figure 4-1 Traffic generation (source: TAFE Wollongbar Due Diligence ptc June 2023)

Considering the maximum load for the Multi-Trades Hub of 216 students and 14 teachers and applying the same trip rate model to determine trips would see 64 Driver Vehicles and 14 drop off vehicles in the AM peak.

Table 4-1 Traffic generation model for 100% attendance (peak period)

	100% Attendance	% arriving in peak	% travelling by car	Car Occupancy	No of total vehicles	Dropped off (18%)	No Driver Vehicles
Students	216	39%	91%	1.1	69		
Staff	14	73%	99%	1.05	9		
					78	-14	64

The difference between this and the 61 trips in the AM peak modelled by ptc in the Due Diligence report is minimal being 3 vph.

Given that Table 4-1 above is based on 100% maximum site load along with 100% students attending, this difference is considered acceptable and the modelling undertaken considered valid to support this assessment.

Quality Traffic Advice

This tested scenario is also providing for the worst case scenario as it assesses the project as if all attendees to the Multi-Trades Hub are additional where in fact the vast majority are already on site. In this way the development will have less impact than this tested scenario. Given the development will see at most 36 additional students and 2 staff associated with the potential for two cabinet making classes transferring from Casino TAFE the actual increase in traffic generation would be 14 trips in the peak hour.

Table 4-2 Traffic generation model for additional staff and students attendance (peak period)

	100% Attendance	% arriving in peak	% travelling by car	Car Occupancy	No of total vehicles
Students	36	39%	91%	1.1	12
Staff	2	73%	99%	1.05	2
					14

4.1.1 Modal Split

The travel surveys undertaken by ptc demonstrated that the attendance on site is very reliant on car usage.

This is consistent with the size of the catchment area for the TAFE and the hourly frequency of buses between Ballina and Lismore, separate to staff and students living in outlying towns and villages.

Similarly, opportunities for cycling and walking to the site is low given the low number of dwellings within a suitable distance as determined by NSW Guidelines for Walking and Cycling (2004).

There is however the potential for the site to benefit from carpooling which is established in the Northern Rivers through the Northern Rivers Carpool (nrcarpool.org).

4.1.2 Daily and Seasonal Factors

Traffic flows associated with this development will have significant variation for both daily flows and seasonal flows. For education developments, the majority of weekday traffic movements occur in the morning and afternoon before and after classes, with staff and students arriving and departing during this period. The traffic flows outside of these times during the day is typically lower. Daily flows vary depending upon timetables.

There will be virtually no flows relating to the proposed development during semester breaks and weekends.

4.1.3 Pedestrian Movements

Additional pedestrian movements within the campus will be catered for by the existing pedestrian facilities including concrete footpaths and pedestrian crossings linking the various carparks to the main buildings.

The new building shall include pedestrian infrastructure linking the building to existing paths on site.

4.2 Traffic Distribution and Assignment

4.2.1 Hourly Distribution of Trips

For the purposes of this assessment trips have been distributed based on the surveys undertaken by ptc.

This allows 39% of students and 73% of staff arriving during the AM peak and 51% of departures of both in the PM peak.

These AM rates were consistent with the surveys undertaken by SECA Solution staff.

4.2.2 Origin / Destinations Assignment

The assignment of traffic to the surrounding road network is assumed to be consistent with the existing demands for vehicles turning into and out of the TAFE as demonstrated below and in **Appendix D**.

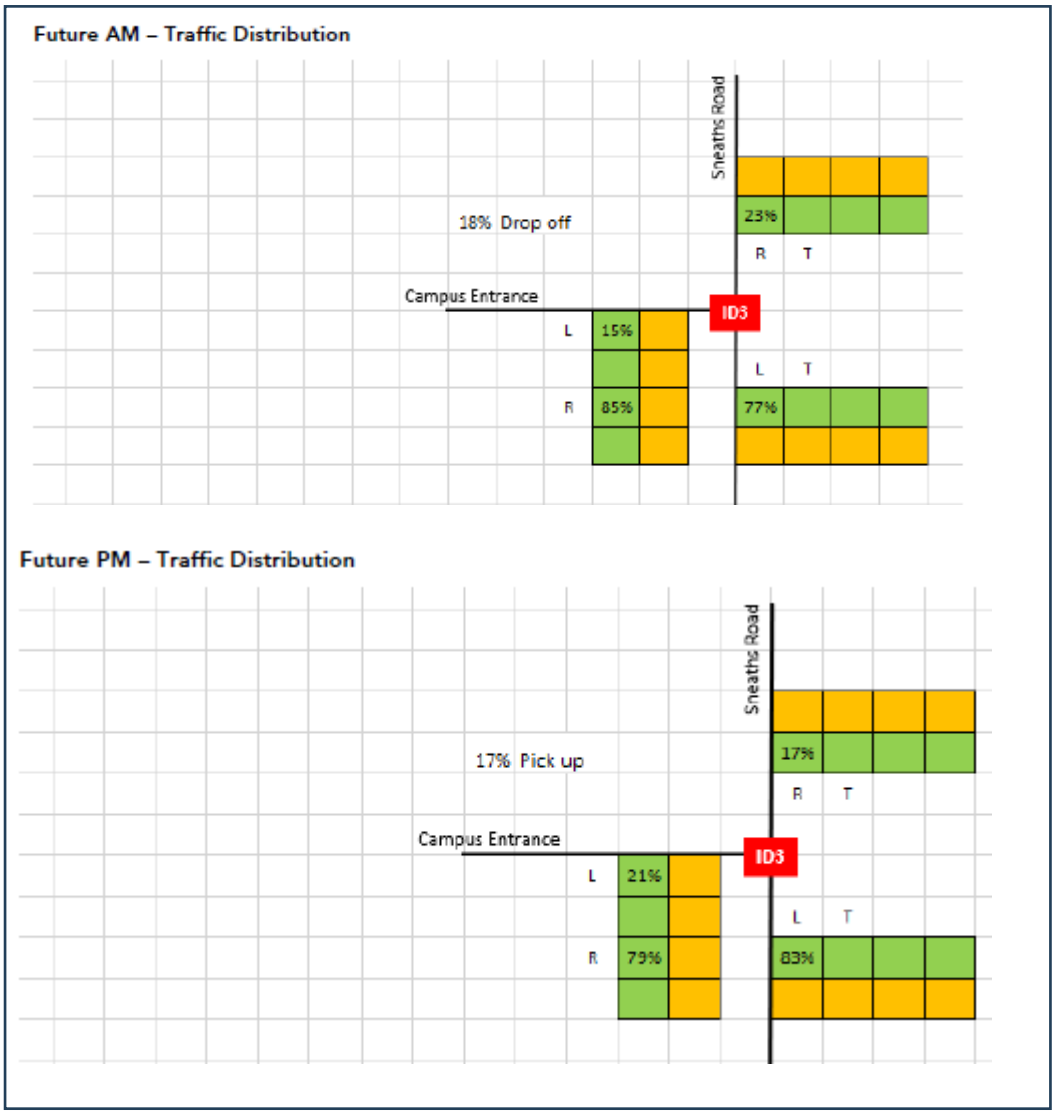


Figure 4-2 Future traffic distribution at the campus entrance/Sneaths Road (source:ptc)

4.3 Impact on Road Safety

It is considered that the additional traffic volumes associated with the project will have a minimal and acceptable impact upon traffic safety.

The additional demands for right turns at the intersection of Sneaths Road and the Bruxner Highway is 8 vph in the AM peak and 41vph, which represents a 15% increase in demands, in the PM peak. This is within the capacity of this intersection which currently operates to an acceptable level of safety given the high volume of vehicles through this intersection. Accident data indicates a low number of serious accidents (1 in the past five years) consistent with its function and there are no noted safety concerns with this intersection layout.

It is considered the additional vehicle movements associated with the proposed development will not have an adverse impact upon the current level of road safety in this location.

Quality Traffic Advice

4.4 Impact of Generated Traffic

4.4.1 Peak Hour Impacts on Intersections

The SIDRA intersection modelling undertaken by ptc for the intersections of the Campus Access and Sneaths Road, Sneaths Road and Lismore Road (roundabout) and Sneaths Road and Bruxner Highway is summarised below and provided in **Appendix F.** This has assessed the current and future operations allowing for the proposed expansion of the TAFE.

The results of this are in Figure 2-6 above which shows three scenarios:

- Existing 2023 Operation (refer Section 2.4.6 above)
- 2028 Operation including + background growth (2%pa for +5 years)
- 2028 Operation including development flows + background growth

The background growth has been applied to the Bruxner Highway through movements only with growth of 2% applied over a 5 years design horizon with the future scenario allowing for the development traffic given that the TAFE expansion is proposed to open in mid 2026/early 2027.

The Sidra modelling demonstrates the intersections shall continue to operate in an efficient manner with the traffic associated with the development flows at LoS A with very minor increases in delays and queueing over the current operation.

The ptc report did consider the future scenario for each of the intersections with their findings as followed:

Sneaths Road / Lismore Road & Sneaths Road / TAFE Wollongbar Campus Entrance

The LoS at both intersections is A in both the morning and afternoon peak hours, and the spare capacity ranges between 91% and 59%.

The tested scenario can be easily accommodated at these two intersections.

Bruxner Highway / Sneaths Road

While the overall LoS is A during both morning and afternoon peak hours, the DoS indicates that there is little spare capacity. With 0.853 v/c in the existing scenario, this intersection is at a tipping point already. This is strengthened by the fact that the DoS increases to 0.985 when adding just the background traffic growth.

The most affected turn movement is the right turn from Sneaths Road into Bruxner Highway during the AM peak hour, for which SIDRA results for all scenarios are shown in Table 11. It is the background growth which results in the LoS to change from D to F, with the proposed uplift of population (only 8vph) seeing an increase in the Average Delay.

Table 11 - SIDRA Output - Right turn from Sneaths Road into Bruxner Highway

Turn Movement	Period	Scenario	LoS	DoS (v/c)	AD (sec)	Q95 (m)
Right turn from Sneaths Road into Bruxner Highway	AM Peak	Existing	D	0.853	30.7	61.2
		Background growth	F	0.985	66.1	114.3
		Future	F	1.036	92.4	114.3

Figure 4-3 Extract from Due Diligence traffic report (source: ptc)

Based on this analysis, it is considered that the tested scenario is not likely to have a negative impact on the surrounding road network and the actual increase in traffic demands associated with the development will be acceptable. The performance of this intersection is impacted by background growth along the Bruxner Highway with the impact of the development traffic being minimal. The intersection of Sneaths Road and the Bruxner Highway is within the corridor identified for the proposed highway upgrade. Whilst no details are available yet for this the upgrade, including of this intersection, it is assumed that Transport for NSW would be making the necessary modifications to provide for the future growth and provision for B-Doubles and Overmass vehicles.

4.4.2 Impact of Construction Traffic

The impact of construction traffic is anticipated to be less than the flows for the development upon completion. As such, there is sufficient spare capacity to accommodate the short term impacts of the construction traffic associated with the proposed Multi-Trades Hub.

Parking associated with construction can be managed within the site.

4.5 Public Transport

4.5.1 Options for improving services

It is considered that the development will not require the provision of any upgrade of public transport. The site is served by both current services including the B-Conx on demand service.

The use of the site as a bus interchange however may see some negative impacts to queuing in the afternoon period. The additional traffic associated with the pick-up of passengers alighting buses may require closer scrutiny to investigate whether changes to this arrangement can improve the operation of the bus stop for both the bus service and exiting motorists. This however is not the responsibility of TAFE NSW to investigate or resolve.

4.5.2 Pedestrian Access to Bus Stops

Pedestrian access to bus stops on campus is sufficient and no additional works are required.

4.6 Pedestrian and Cyclists

The site does not provide external connections to existing pedestrian and cyclist facilities. Based on observations however the demand for this is minimal being one pedestrian approaching from the north and one cyclist. This demand is unlikely to change significantly given the regional catchment for the TAFE and does not generate the requirement for any additional works.

Quality Traffic Advice

5. Summary and Recommendations

5.1 Summary

The travel demands associated with the proposed development, whilst seeing an increase in student and staff numbers (up to 36 students and 2 staff), can be accommodated without the need for changes in transportation or traffic arrangements. The survey of the existing parking demands demonstrates that there is adequate capacity to accommodate the additional demands associated with the development based on the DCP parking requirement for 51 parking spaces.

Of the proposed new attendees to the Multi-Trades Hub a small number are students who shall relocate to Wollongbar TAFE from the cabinet making course at Casino TAFE. The balance will be staff and students from courses already running at Wollongbar, relocating into the new upgraded facilities. To provide a robust assessment, the tested scenario has allowed for the staff and students associated with the Multi-trades Hub to be considered additional to the campus as well as quantifying the lower traffic generation for the additional student places and staff.

Existing public transportation can provide for additional demands whilst cycling and pedestrian facilities are appropriate given the large geographic catchment for the campus. There is an opportunity for the TAFE to investigate the introduction and promotion of carpooling such as NRCARPOOL.ORG.

The assessment of the existing situation has determined that there is adequate capacity within the road network to accommodate the increase in traffic volumes associated with the development of the Multi-Trades Hub.

The intersections of Sneaths Road/Campus Access and Sneaths Road/Lismore Road were modelled by *ptc* using SIDRA intersection modelling software for the current AM and PM peak traffic flows. The results indicate that these operate well with overall LoS A for the intersections. This is consistent with observations on site, where traffic flowed efficiently, and vehicle queues dispersed. Allowing for the traffic associated with the proposed development these intersections will continue to operate to their current standard.

The intersection of Sneaths Road and the Bruxner Highway also operates at a LoS A however the critical right turn from Sneaths Road onto the highway operates at a LoS D reflecting the number of opposing vehicles on the highway. A background growth factor of 2% pa in the AM and PM, was applied for the 2028 design horizon which sees this intersection continue to operate at overall LoS A. The increase in delays and queuing however for the right turns out of Sneaths Road, impacted by the background growth sees this approach fail over this period. It is noted that the proposed project would open by mid-2026/early 2027. The impact of 14 additional trips in the peak hour is however minimal and therefore acceptable.

This intersection has been identified as part of a future highway upgrade between Wollongbar and Goonellabah **(Appendix B).** There is however no funding for the next phase of this project at this time.

The parking beat survey undertaken for the site indicates that there is around 30% of underutilised parking on site. The availability of 180 space is therefore adequate to accommodate the 51 parking spaces required under the Ballina DCP to provide for this project. The proposed development would see a minor change (less 4 spaces) to the existing supply of parking on campus. The increased demand associated with the Multi-Trades Hub is therefore able to be accommodated within the available parking.

The availability of cycling and public transport access to the campus for both staff and students, as well as carpooling, can be encouraged to improve the overall demand for parking on site by reducing the demand for single car drivers.

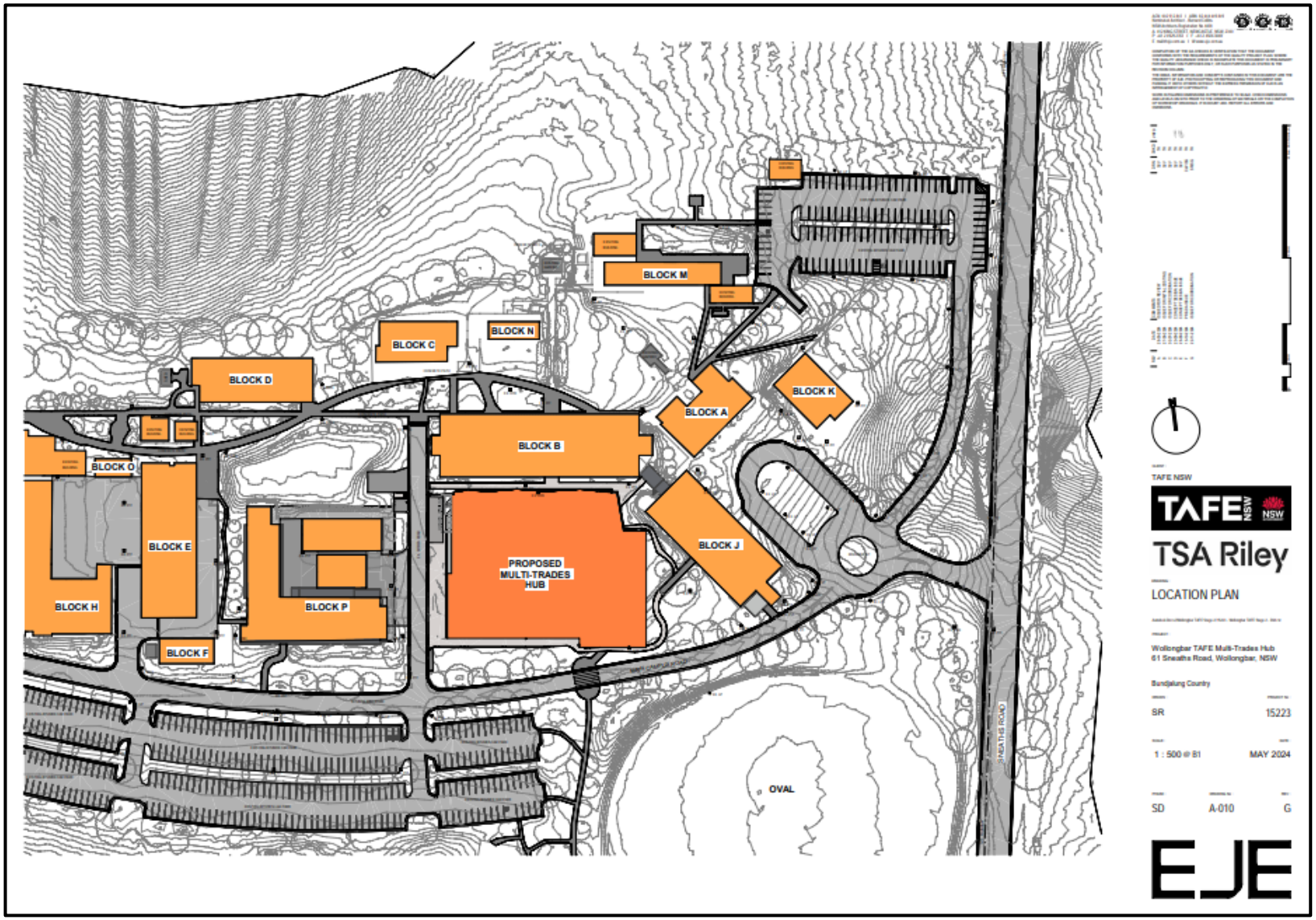
5.2 Recommendations

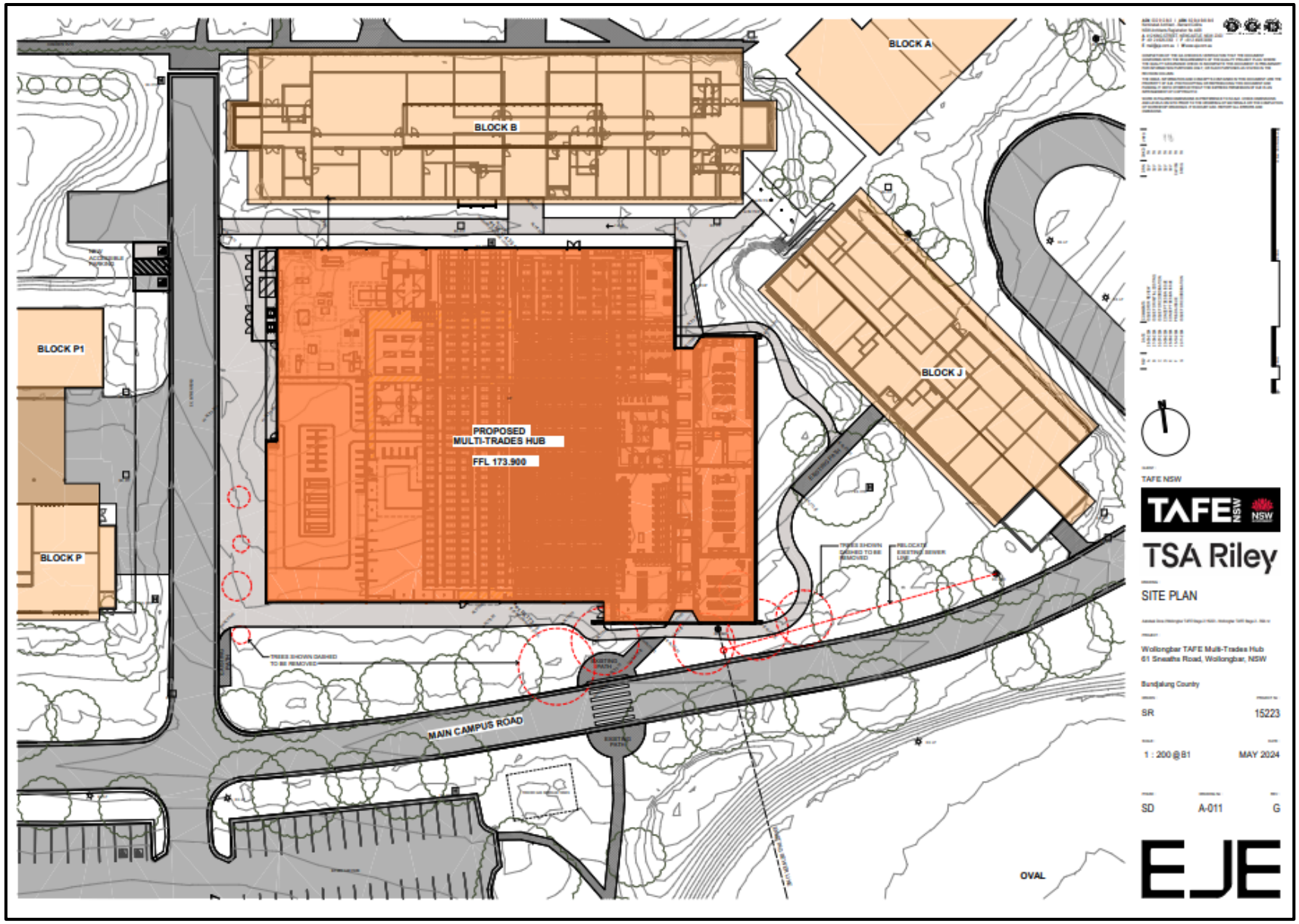
The overall conclusion from the investigations is that traffic, parking and access arrangements for the development proposal are satisfactory and that there is no need for changes to traffic or parking provisions / controls to accommodate this development. This expansion can be accommodated allowing for an increase in campus attendance, and the local road network has adequate capacity to cater for this.

Whilst it is acknowledged that upgrades to the Bruxner Highway intersection may be required to accommodate background growth in through traffic the impact of 14 additional trips in the peak hour is acceptable.

Quality Traffic Advice

Appendix A Site Plan




BLOCK A
BLOCK B
BLOCK P1
BLOCK P
BLOCK J
PROPOSED
MULTI-TRADES HUB
FFL 173.900
MAIN CAMPUS ROAD
OVAL
TAFE NSW
TSA Riley
SITE PLAN
Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW
Bundjalung County
SR
15223
1 : 200 @ B1
MAY 2024
SD
A-011
G
EJE

Appendix B Bruxner Highway Upgrade Preferred Corridor

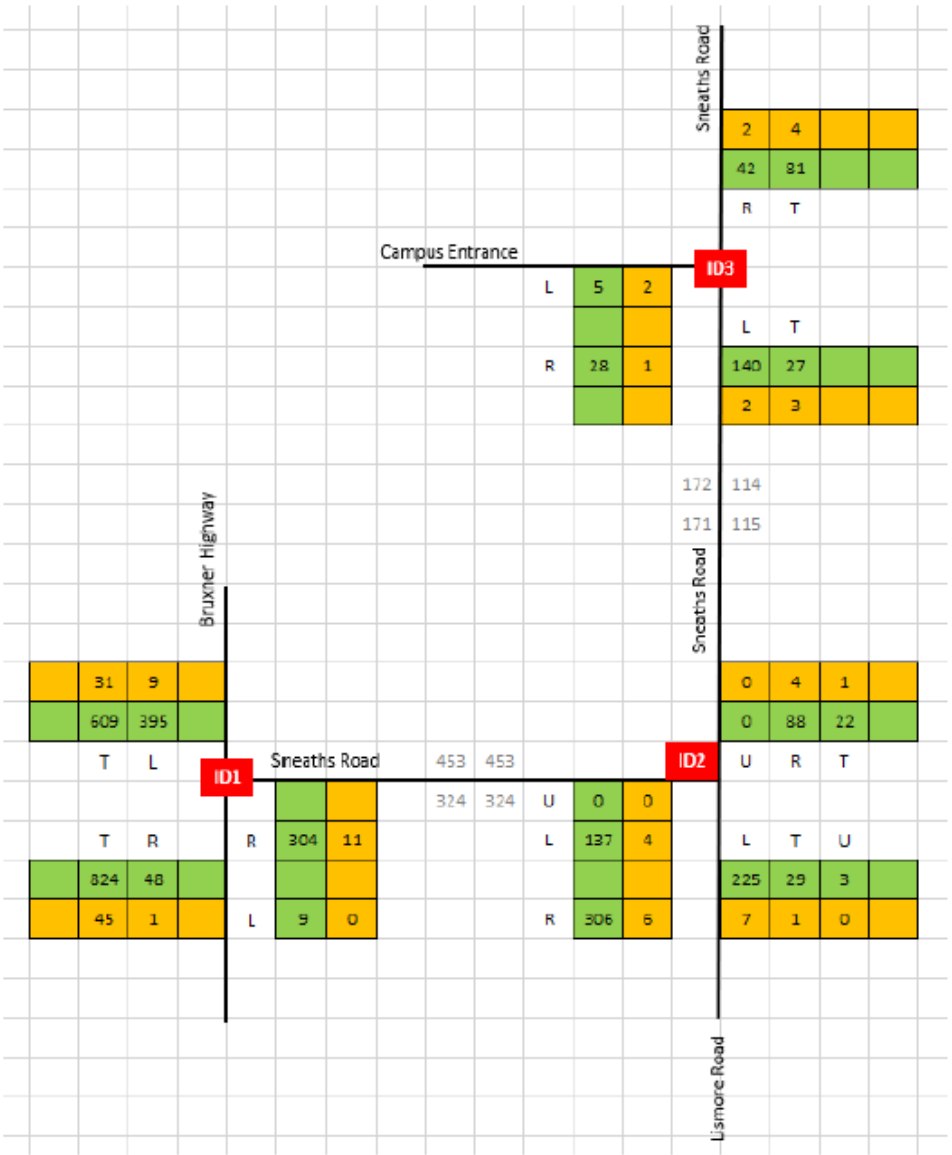
Bruxner Highway–Wollongbar to Goonellabah Project update December 2024 Page 2 of 4

Bruxner Highway–Wollongbar to Goonellabah Project update December 2024 Page 3 of 4

Appendix C Traffic Data

ptc.

Existing AM Traffic Volumes

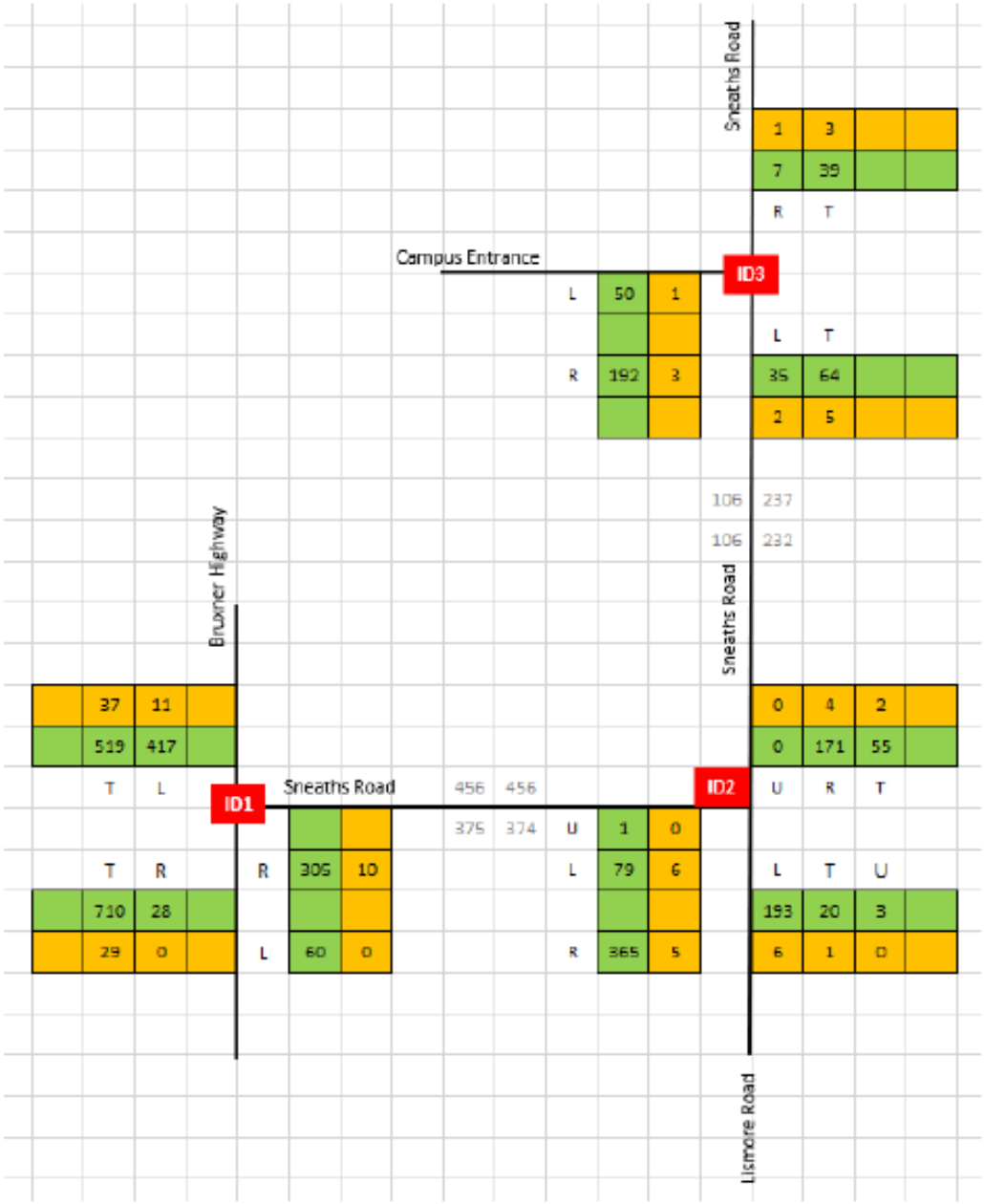


TAFE NSW, TAFE Wollongbar Due Diligence, 5th June 2023 3

Quality Traffic Advice

ptc.

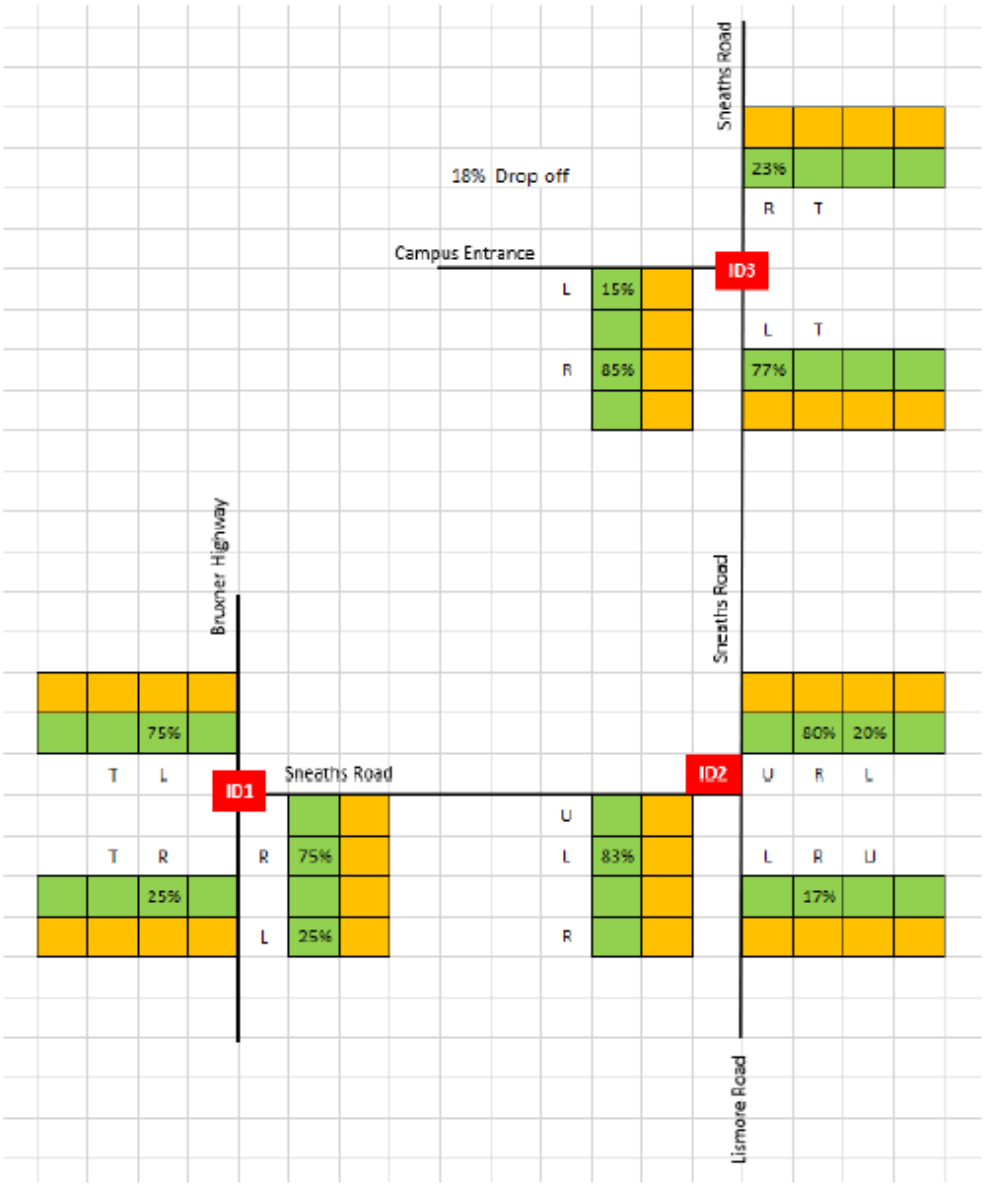
Existing PM Traffic Volumes



Appendix D Trip Distribution

ptc.

Future AM – Traffic Distribution

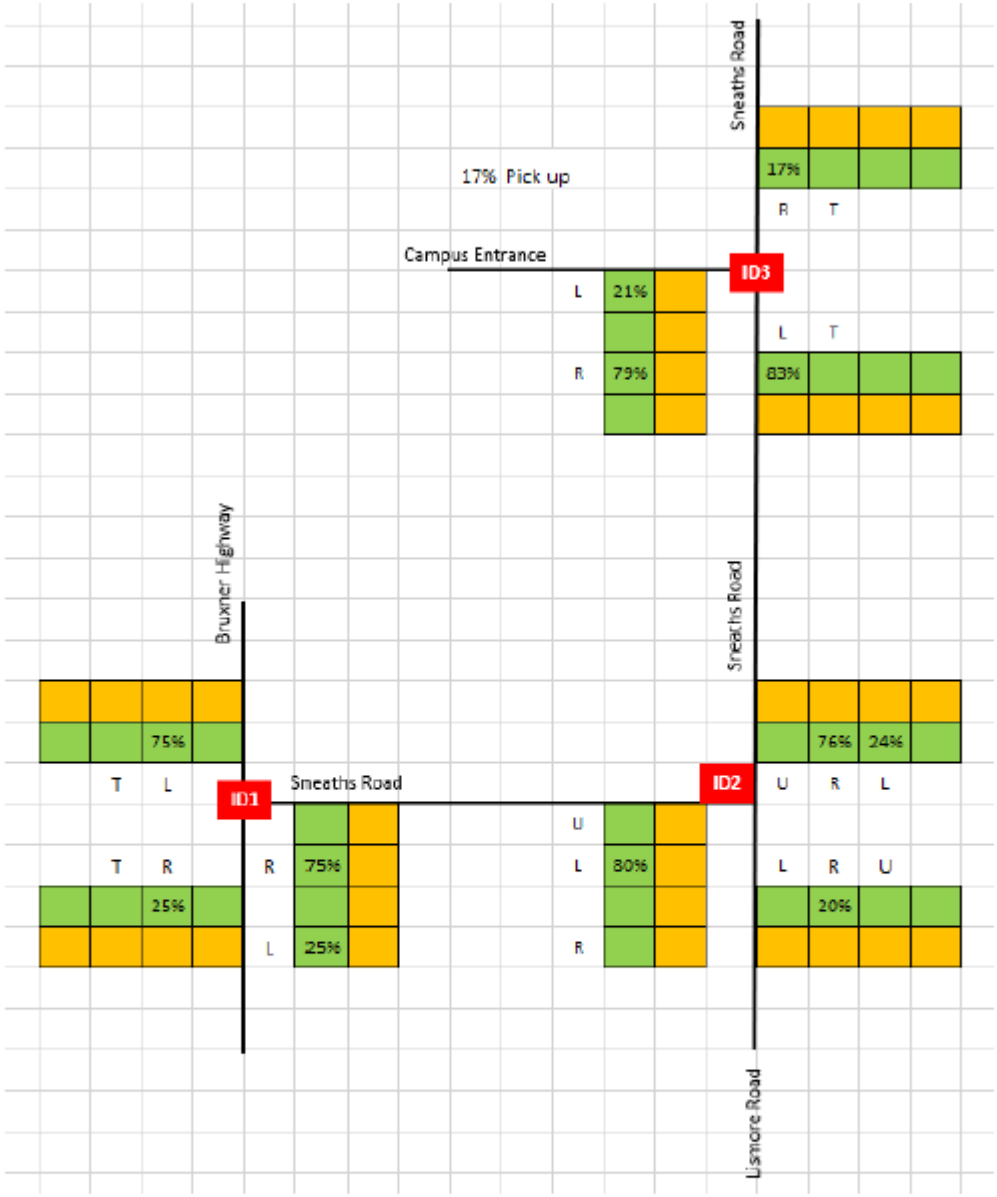


TAFE NSW, TAFE Wollongbar Due Diligence, 5th June 2023 7

Quality Traffic Advice

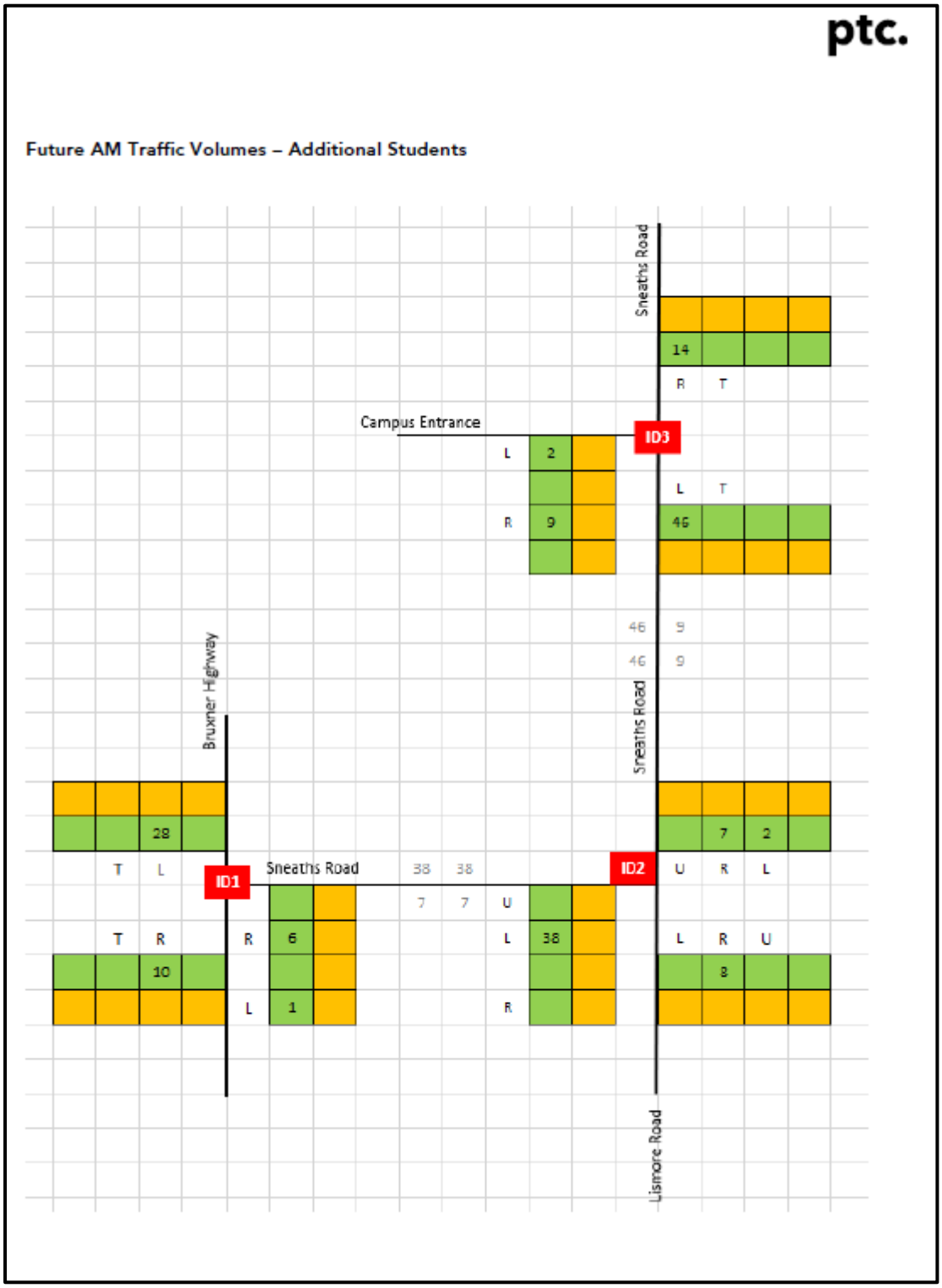
ptc.

Future PM – Traffic Distribution



TAFE NSW, TAFE Wollongbar Due Diligence, 5th June 2023 8

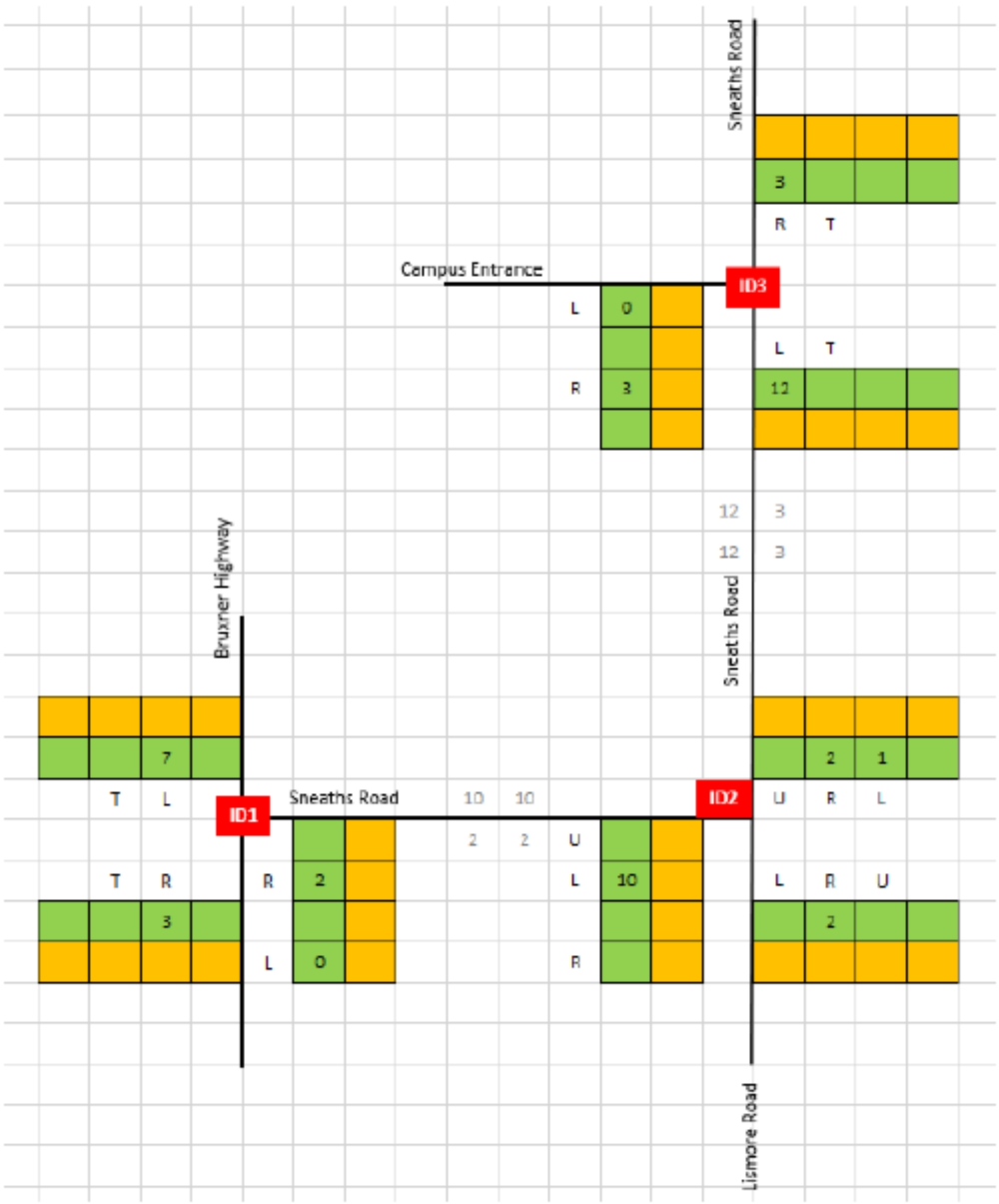
Appendix E Development Traffic Data



Quality Traffic Advice

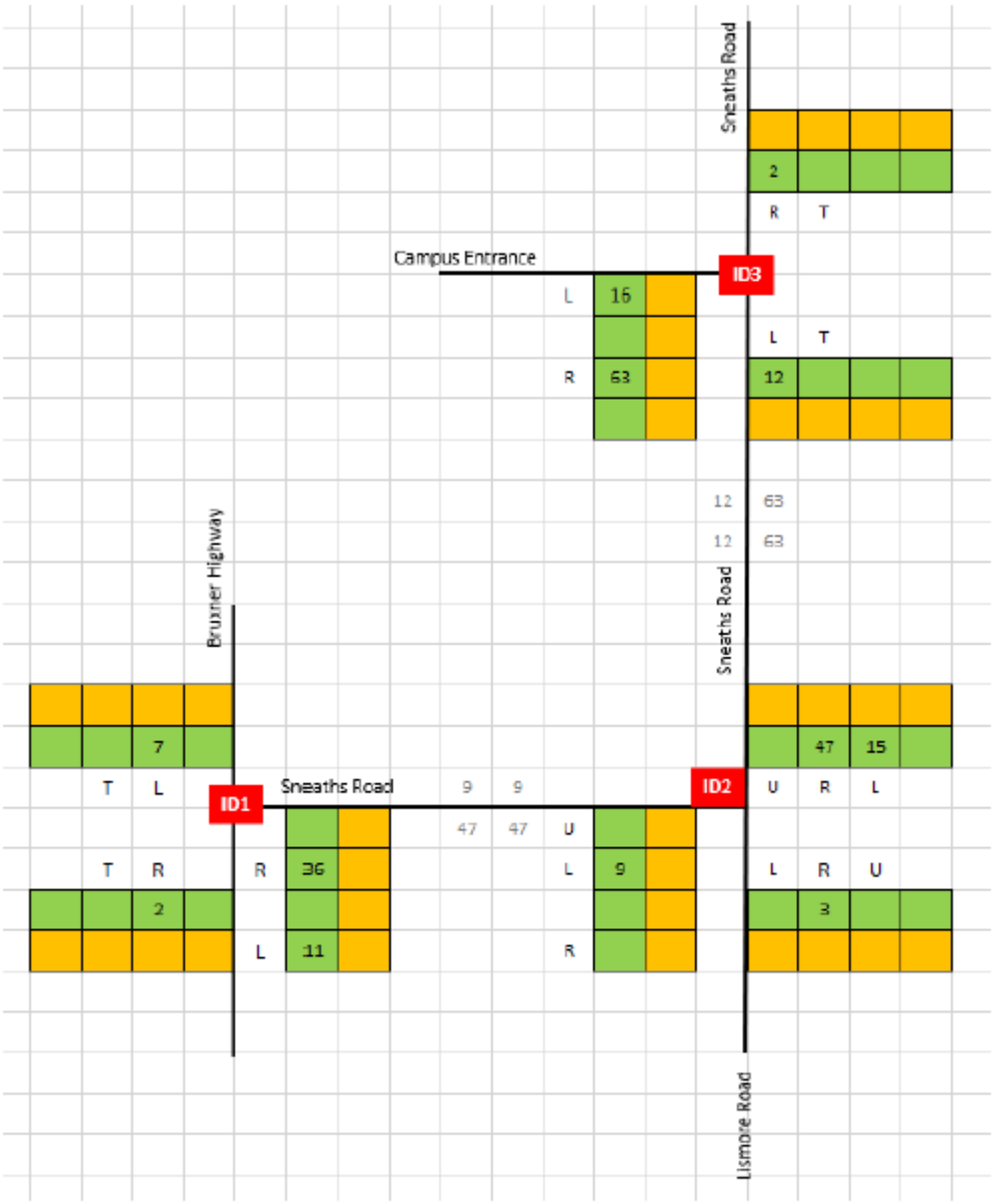
ptc.

Future AM Traffic Volumes – Additional Staff



ptc.

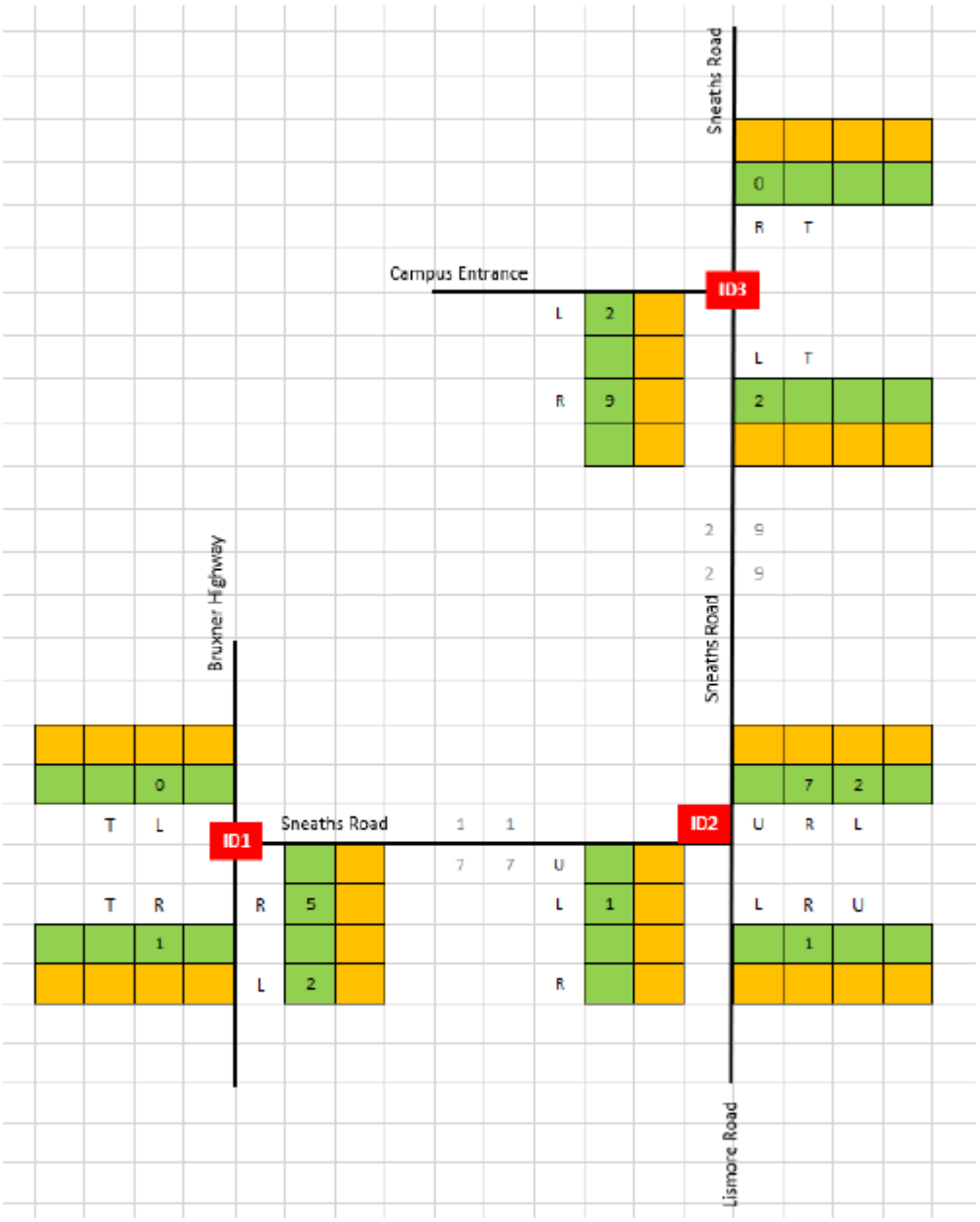
Future PM Traffic Volumes – Additional Students



Quality Traffic Advice

ptc.

Future PM Traffic Volumes – Additional Staff



TAFE NSW, TAFE Wollongbar Due Diligence, 5th June 2023 12

Appendix F SIDRA Analysis and SIDRA Outputs

Interpreting SIDRA Results:

1-Level of Service (LoS)

LoS	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Good	Good
B	Good, with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but requires accident study
D	Operating near capacity	Near capacity and requires accident study
E	At capacity, excessive delay: roundabout requires other control method	At capacity, requires other control mode
F	Unsatisfactory, requires other control mode or additional capacity	Unsatisfactory, requires other control mode

2-Average Vehicle Delay (AVD)

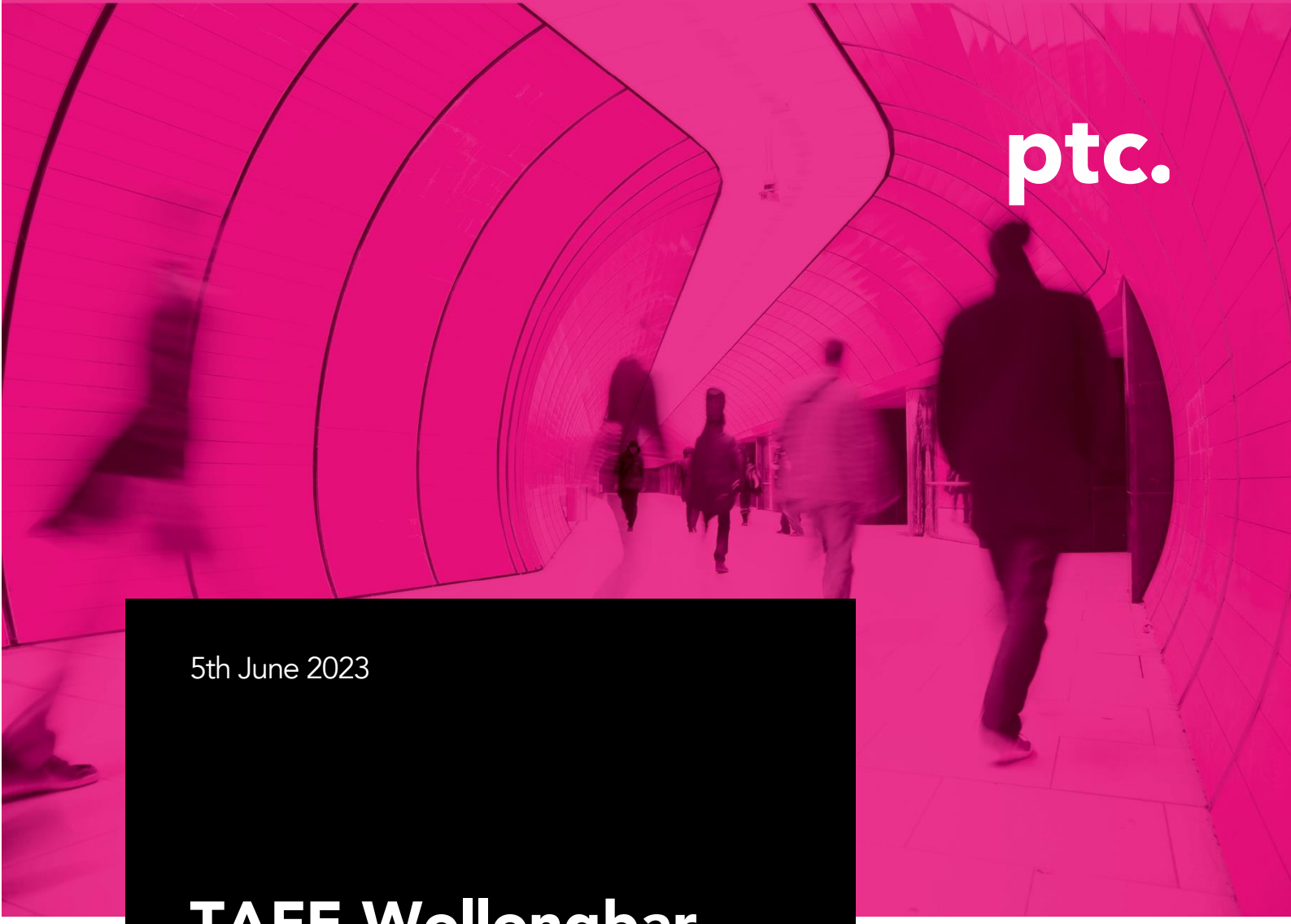
The AVD is a measure of operational performance of an intersection relating to its LoS. The average delay should be taken as a guide only for an average intersection. Longer delays may be tolerated at some intersections where delays are expected by motorists (e.g. those in inner city areas or major arterial roads).

LoS	Average Delay / Vehicle (secs)	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Less than 15	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28 to 42	Satisfactory	Satisfactory but accident study required
D	42 to 56	Operating near capacity	Near capacity, accident study required
E	56 to 70	At capacity, excessive delays: roundabout requires other control mode	At capacity; requires other control mode
F	Exceeding 70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode

3-Degree of Saturation (D/S)

The D/S of an intersection is usually taken as the highest ratio of traffic volumes on an approach to an intersection compared with the theoretical capacity and is a measure of the utilisation of available green time. For intersections controlled by traffic signals, both queues and delays increase rapidly as DS approaches 1.0. An intersection operates satisfactorily when its D/S is kept below 0.75. When D/S exceeds 0.9, queues are expected.

Quality Traffic Advice



5th June 2023

TAFE Wollongbar Due Diligence

TAFE NSW report;

For: **TAFE NSW**

Site Address: **61 Sneaths Rd, Wollongbar NSW 2477**

document control;

Issue:	Date	Issue details	Author	Reviewed
1	22/05/2023	Draft	DK	KB
2	05/06/2023	Final	DK	KB

For the attention of:

Susan Phounsavan

Senior Project Manager

TAFE Wollongbar

Contact:

Kasia Balsam

+61 2 8920 0800

kasia.balsam@ptcconsultants.co

COMMERCIAL IN CONFIDENCE
The information contained in this document, including any intellectual property rights arising from designs developed and documents created, is confidential and proprietary to **ptc.** This document may only be used by the person/organisation to whom it is addressed for the stated purpose for which it is provided and must not be imparted to or reproduced, in whole or in part, by any third person without the prior written approval of a **ptc.** authorised representative. **ptc.** reserves all legal rights and remedies in relation to any infringement of its rights in respect of its intellectual property and/or confidential information.
© 2022

ptc.
Suite 502, 1 James Place, North Sydney NSW 2060
info@ptcconsultants.co I (+61) 2 8920 0800 I ptcconsultants.co
ABN 85 114 561 223

contents;

1.Introduction **1**
1.1. Project Summary 1
1.2. Land Use 2
1.3. Wollongbar Campus 3

2.Existing Transport Facilities **5**
2.1. Road Hierarchy 5
2.2. Public Transport 6
2.3. Active Transport 7
2.3.1. Cycling 7
2.3.2. Walking 8

3.Data Collection **9**
3.1. Travel Mode Surveys 9
3.2. Traffic Surveys 11

4.Parking Assessment **14**
4.1. Current Parking Demand 14
4.1.1. Based on DCP Requirements 14
4.1.2. Based on Surveys 15
4.2. Future Parking Demand 16

5.Traffic Impact Assessment **17**
5.1. Modelling Scenarios 18
5.2. SIDRA Results 19

6.Conclusion and Recommendations **21**

7.Limits of this Report **23**

Appendix 1. Travel Mode Survey Results

Appendix 2. Current and Future Traffic Volumes and Distribution

Appendix 3. SIDRA Output

contents;

Table 1 - Current On-Campus Parking Capacity 3
Table 2 - Bus Services Summary (Source: Transport NSW) 6
Table 3 - Current Parking Demand Based on DCP Requirements 14
Table 4 - Current Parking Demand Based on Surveys 15
Table 5 - Verification Check 16
Table 6 - Comparison: Future Parking Requirements per DCP vs. ptc. Future Parking Demand Model 16
Table 7 - Intersection Performance - Levels of Service 17
Table 8 - Future Additional Traffic Volumes for Increased Student and Staff Number 18
Table 9 - Split of Future Additional Traffic Volumes 18
Table 10 - SIDRA Output - Existing Traffic Volumes 19
Table 11 - SIDRA Output - Right turn from Sneaths Road into Bruxner Highway 20

Figure 1 - Campuses in the Northern Rivers Region 1
Figure 2 - Local Land Use Map (Source: NSW Planning Viewer) 2
Figure 3 - Current On-Campus Parking Provision 3
Figure 4 - Vehicular Access 4
Figure 5 - Road Classification (Source: TfNSW) 5
Figure 6 - Public Transport Map 6
Figure 7 - Cycleway map (Source: Google Map) 7
Figure 8 - Student and Staff Travel Mode - AM & PM 10
Figure 9 - Key Intersection Location Map 11
Figure 10 - Location of Tube Couts 12

contents;

Figure 11 - Tube Count Result Charts 13

1. Introduction

1.1. Project Summary

ptc. have been engaged by TAFE NSW to undertake a due diligence traffic and parking assessment for the potential expansion of the Wollongbar Campus.

TAFE NSW is currently undertaking a business case to determine if there is an opportunity to make the Wollongbar campus (the "Campus") the main hub for the Northern Rivers regions, see the map below for campuses involved. This will involve an increase in the current student and staff population, which has the potential to result in an increased traffic activity and the parking demand.

It is understood that the potential student increase has not been defined yet, but that there are considerations of around 500. Therefore, an increase of 500 students, and an equivalent proportion of staff (27) has been adopted for the purpose of parking and traffic modelling.

This report sets out the potential traffic and parking implications on the site and the surrounding road network associated with the additional population.

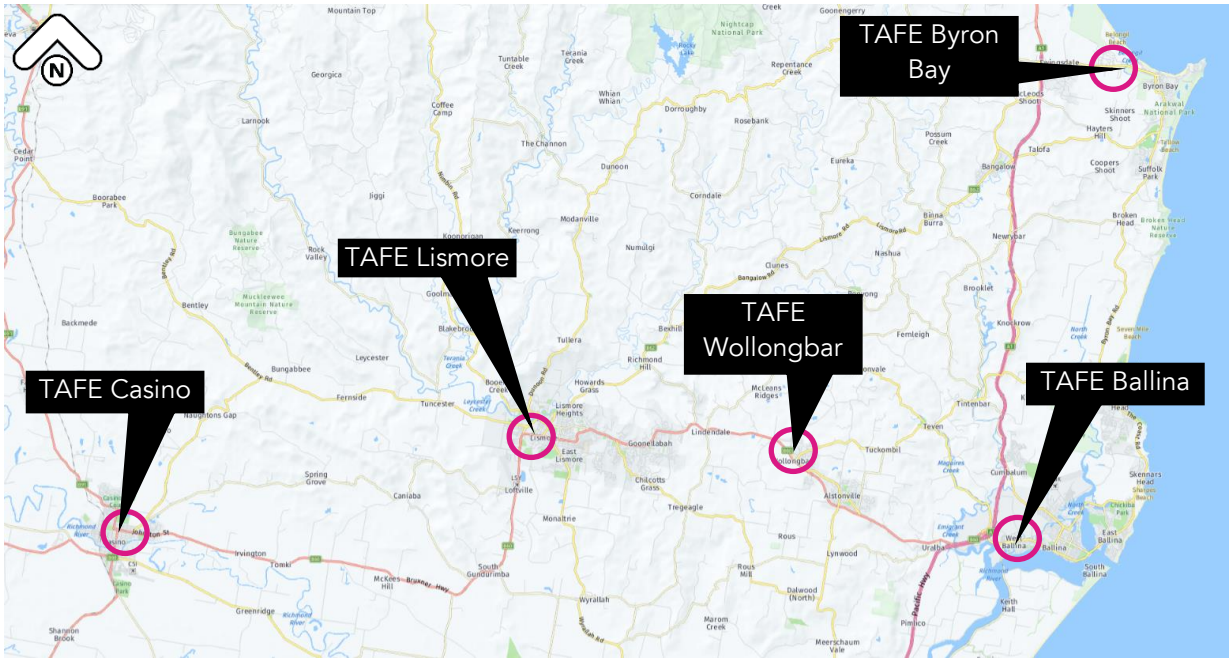


Figure 1 - Campuses in the Northern Rivers Region

1.2. Land Use

The Campus is located in RU1 (Primary Production) zone, refer to Figure 2. There is a large residential zone (R2 – Low Density Residential & R3 – Medium Density Residential) to the east and DM (Deferred Matter) zone.

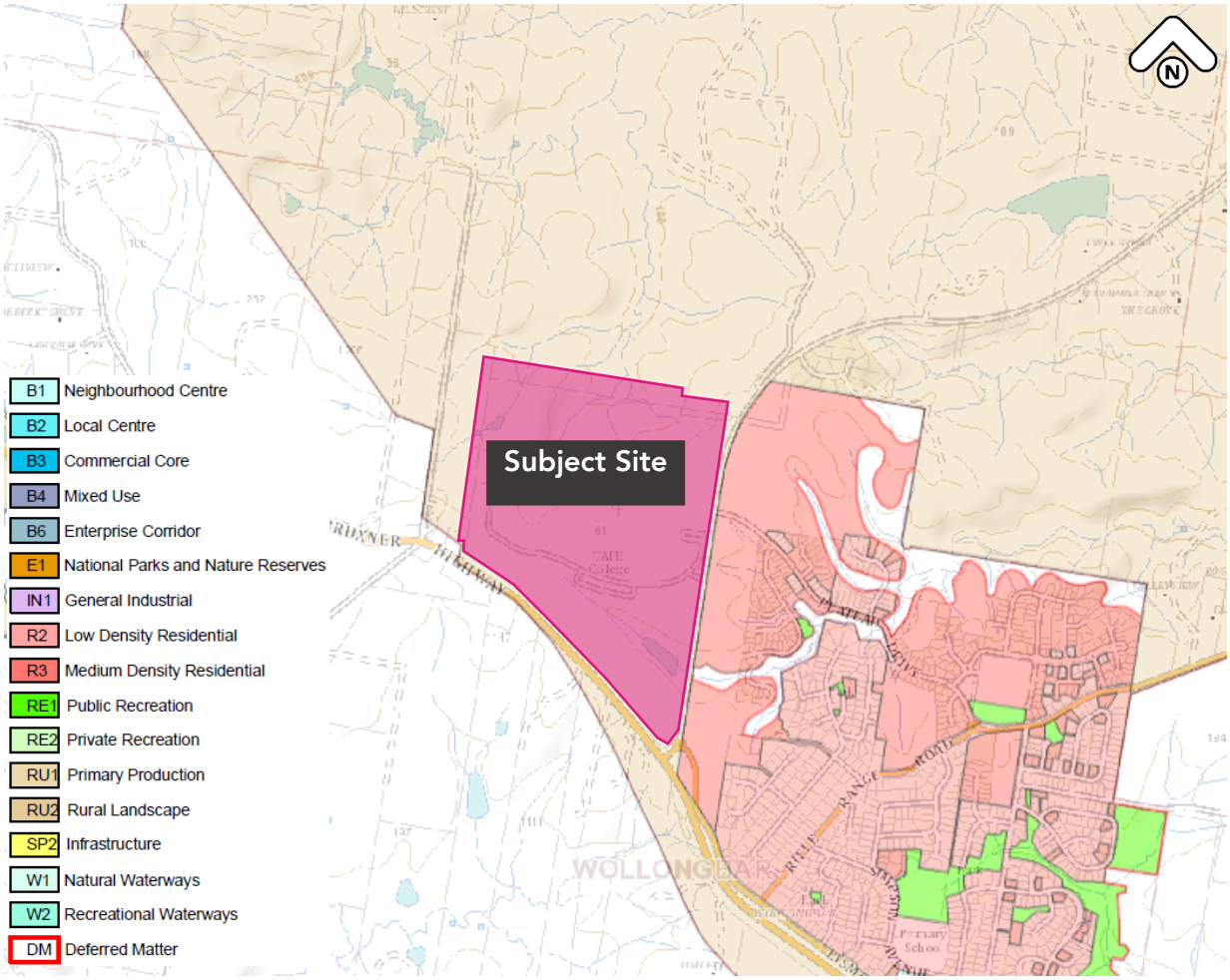


Figure 2 - Local Land Use Map (Source: NSW Planning Viewer)

1.3. Wollongbar Campus

The Campus is located at 61 Sneaths Road, Wollongbar. The current on-campus parking provision is as follows:

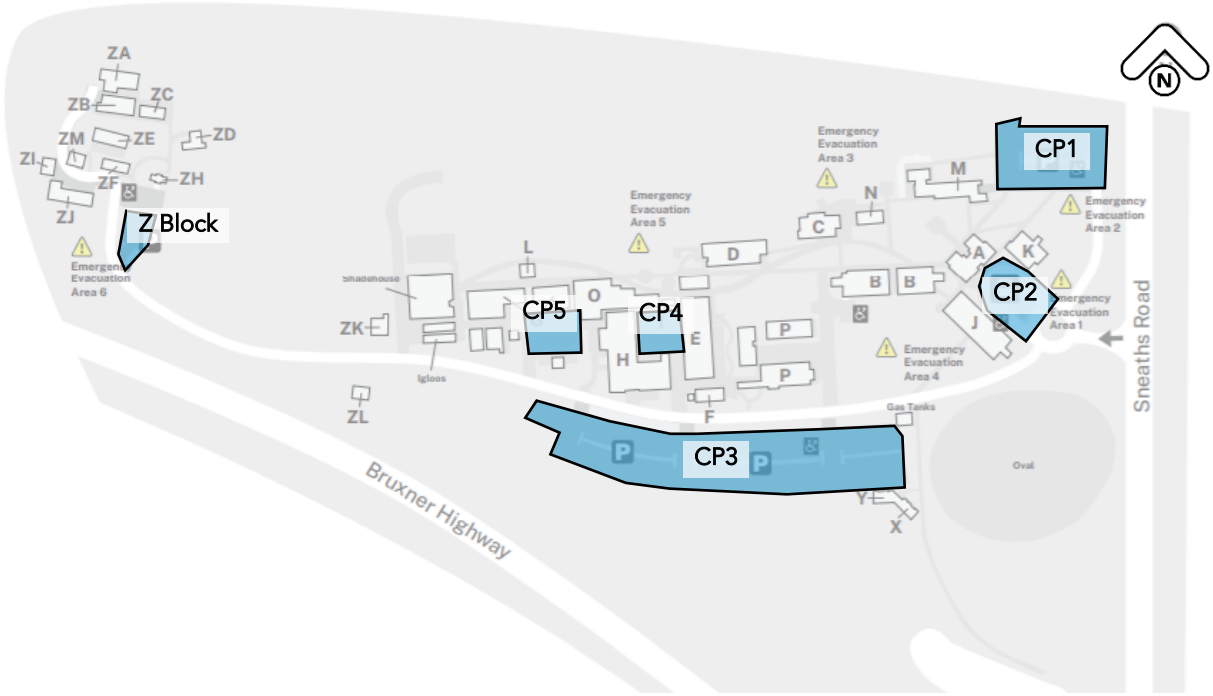


Figure 3 - Current On-Campus Parking Provision

Table 1 - Current On-Campus Parking Capacity

Location	User Category	Approx. Capacity (source: Nearmap)
Car Park 1	Mixed Use Students and staff	112
Car Park 2	Pick up / Drop off and staff	12
Car Park 3	Mixed Use General parking (students, staff, visitors) and fleet vehicles	339
Car Park 4	Staff and deliveries	14
Car Park 5	Staff and deliveries	61
Z Block	Mixed Use	30
	Total on-campus capacity (approx..)	568
	Total on-campus capacity excl. Pick up/Drop off Spaces	**556**

Vehicular access to the Campus is provided via Sneaths Road.

Car park access points within the campus are shown in the figure below.

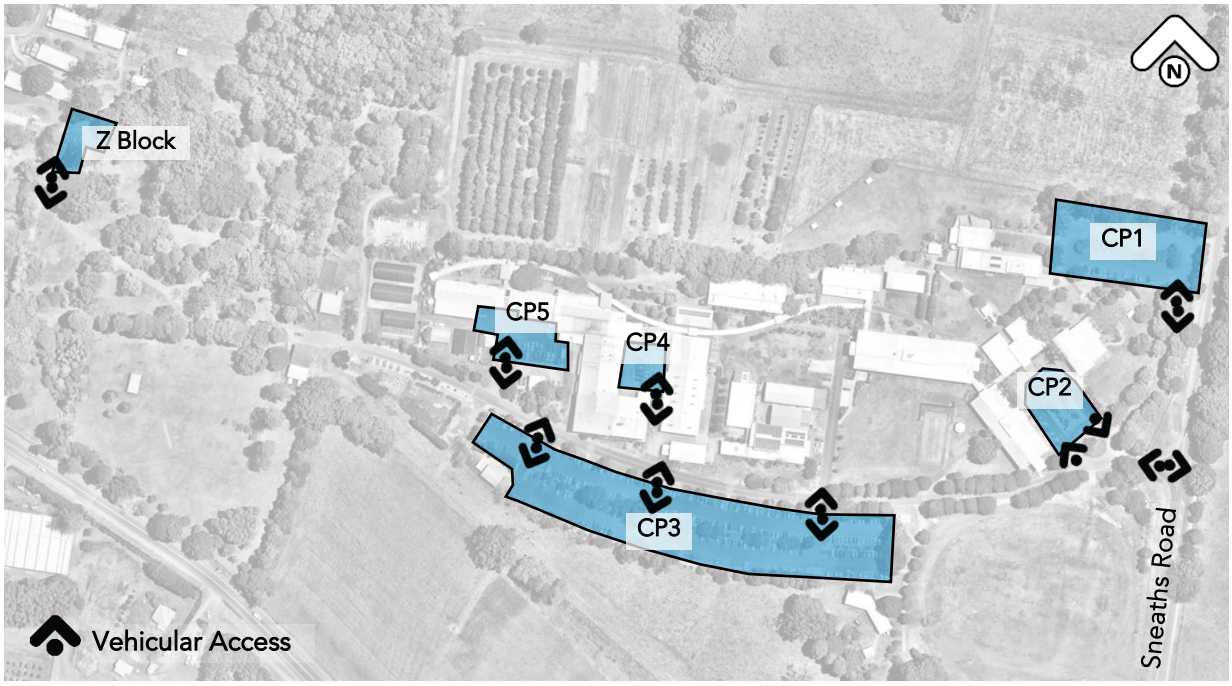


Figure 4 - Vehicular Access

The following operational arrangements are in place:

- Some courses are offered at multiple campuses, while others are offered at only certain locations.
- Students generally travel to one campus for their courses and stay on campus for a minimum of 4 hours. The majority stays for 6-8 hours and attends the campus 3-4 days a week.
- Staff may be allocated across a mini sub region, and throughout the week may be delivering courses at various campuses. TAFE NSW has fleet vehicles available for staff who book to travel between campuses.

2. Existing Transport Facilities

2.1. Road Hierarchy

The subject site lies in the suburb of Wollongbar and is primarily serviced by a state road (Bruxner Highway) and a local road (Sneaths Road).

A summary of the State, Reginal and Local roads serving the site is presented in Figure 5.

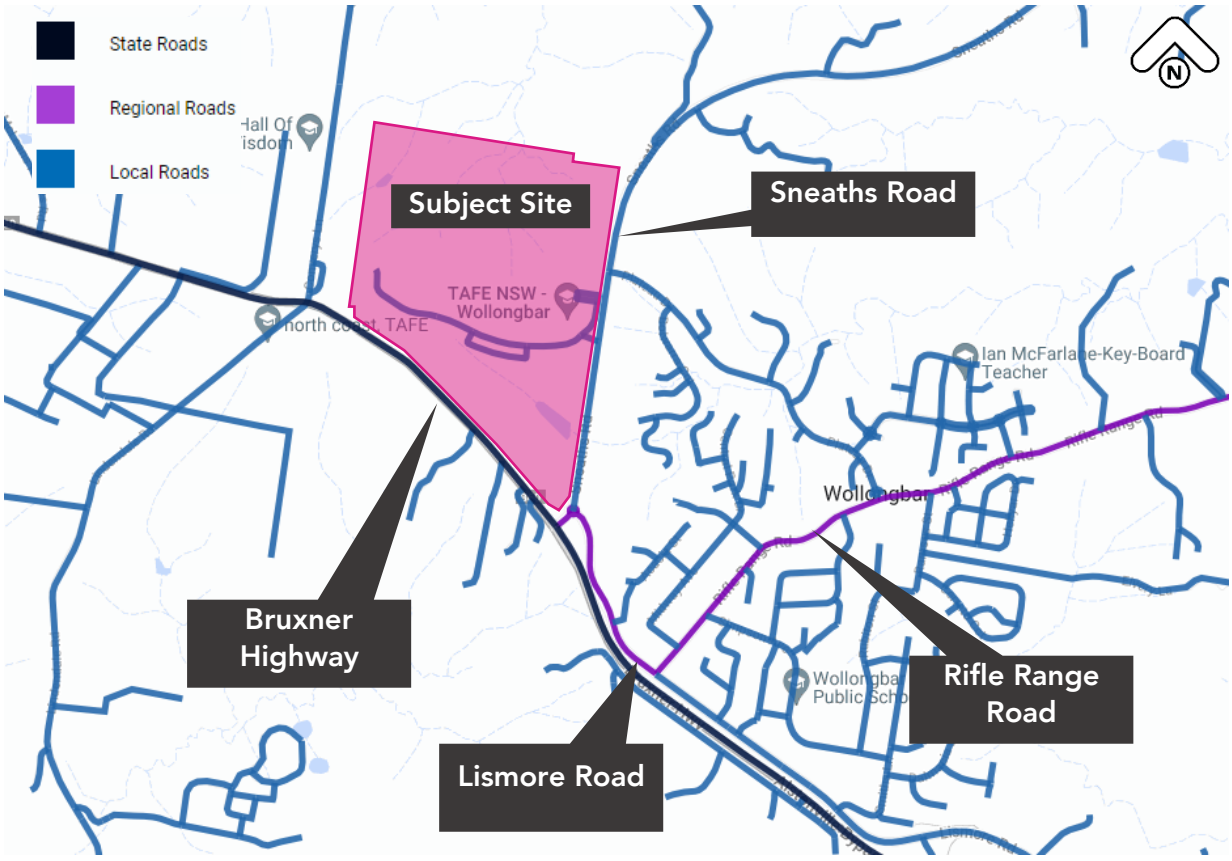


Figure 5 - Road Classification (Source: TfNSW)

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy:

- State Roads: Freeways and Primary Arterials (TfNSW Managed);
- Regional Roads: Secondary or sub-arterials (Council Managed, Part funded by the State);
- Local Roads: Collector and local access roads (Council Managed).

2.2. Public Transport

The locality has been assessed in the context of available forms of public transport that may be utilised by students and staff. When defining accessibility, reference is made to the NSW Planning Guidelines for Walking and Cycling (2004) (the Cycling and Walking Guide), where a distance of 400-800m is recommended as a comfortable walkable catchment to access public transport and local amenities. The document also suggests a distance of 1500m as a suitable catchment for cycling.

Figure 6 illustrates the walkable 400m and 800m catchments from the subject site, together with the nearest bus stops in the vicinity of the site. Details of the bus services are outlined below.

Figure 6 - Public Transport Map

There are a couple of bus services within the 400m and 800m catchments, with the closest being the "Wollongbar TAFE, Sneaths Rd" bus stop at the intersection of the TAFE access with Sneaths Road.

Bus services, including coverage, approximate operation times and frequency, are summarised in the table below.

Table 2 - Bus Services Summary (Source: Transport NSW)

Bus Route	Coverage	Frequency (approximate)
661	Lismore to Ballina	Every 60min
662	Lismore to Lennox Head	Every 60min

Bus services near the site are considered limited, thus it is not expected that public transport is a major travel mode amongst the Wollongbar campus attendees.

2.3. Active Transport

The locality has been reviewed for features that would attract active transport trips (walking and cycling), with reference to the NSW Guidelines for Walking and Cycling (2004).

2.3.1. Cycling

A review of the local cycling infrastructure has been undertaken to determine the overall accessibility of the subject site by active transport. Figure 7 shows the local bicycle network surrounding the development site. "Bike friendly" roads such as Sneaths Road and Lismore Road provide access to the south-eastern suburbs (e.g. Alstonville).

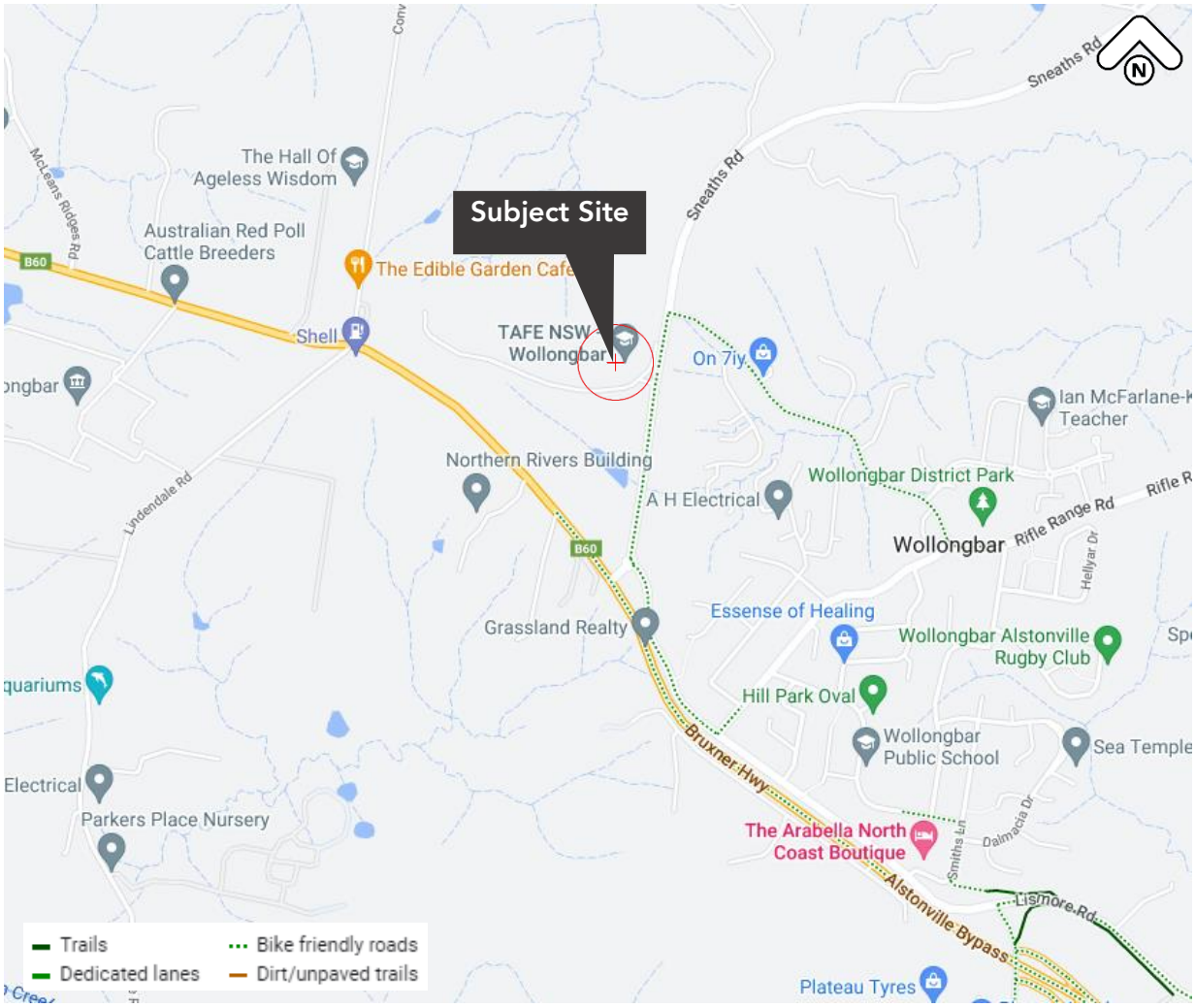


Figure 7 - Cycleway map (Source: Google Map)

Based on the review of the cycling infrastructure, it appears that the site is relatively well-served by bike-friendly roads leading to the south-eastern suburbs such as Wollongbar, but lacks bike paths in other directions. It is also noted that the enrolment catchment of the TAFE Wollongbar is large, thus cycling is not considered to be the main mode of travel.

2.3.2. Walking

Walking is a viable transport option for distances under one kilometre (approximately 15-20min) and is often quicker for short trips door to door.

The nearby road network comprises local streets and a state road, and most of them have paved footpaths on at least one side of the carriageway (except Bruxner Highway which has no formal foot paths for pedestrians). Some of the footpaths are staggered with trees. There are no pedestrian crossings (e.g. Zebra crossing, signalised crossing) near the site.

Based on the above, the pedestrian infrastructure is considered to be underdeveloped in the vicinity of the subject site. Further, the enrolment catchment of the TAFE Wollongbar is large, thus walking is not considered to be the main mode of travel.

3. Data Collection

3.1. Travel Mode Surveys

An online travel survey was conducted with students and staff. The objective of the questionnaire was to identify the existing travel behaviour and parking demand, and to assist with the future development forecast for traffic assessment purposes.

The survey was active for 35 days from 15th March 2023 to 18th April 2023 and resulted in a total of 336 responses comprising 217 student responses (9% out of 2,502 students), 79 staff responses (66% out of 120 staff) and 40 responses indicating that the respondents do not attend the Wollongbar campus. The survey was not issued to visitors and trades people.

The full results are presented in Appendix 1, whereas the following points represents a summary and discussion of the main results:

- The response rate of 9% for students is considered low, meaning that the results from the survey may not be accurate.
- 12% (40 of 336) of all interviewees do not attend the Wollongbar campus. For the purpose of this study, it is assumed that these respondents are students.
- The highest attendance at the campus was shown to occur on Mondays, with 37% of students and 81% of staff.
- 74% of students and 91% of staff stay on campus for more than 6 hours, which is considered a full day for traffic modelling purposes (i.e. these attendants are likely to travel during typical school morning and afternoon peak hours).
- The travel mode share for morning and afternoon is presented in Figure 8. Car is by far the predominant travel mode for both staff and students, which is likely related to the location of the campus (rural area) and the large enrolment catchment.
- Given the low student response rate, a contingency of +/- 5% for the car use has been adopted when calculating the parking estimation. This results in a range of 73%-83% of students driving.
- The average car occupancy of students and staff is 1.10 and 1.05 campus attendants per car.
- Some responses suggest that if staff were helped with finding another driver, they may consider carpooling. This would potentially reduce the car parking demand.
- The second highest travel mode utilised is bus. Comments suggest that the bus connectivity is not ideal, and both staff and students indicated that they would use public transport if there were more bus routes and/or more frequent services.
- Very few students and staff cycle or walk to the campus, which is likely related to underdeveloped infrastructure and the large enrolment catchment (over 89% of students live more than 10km to the Wollongbar campus).
- 65% of students who drive park in the southern car park (CP3), while 20% park in the northern car park (CP1). 41% of staff who drive park in the southern car park, while 43% park in the northern car park.

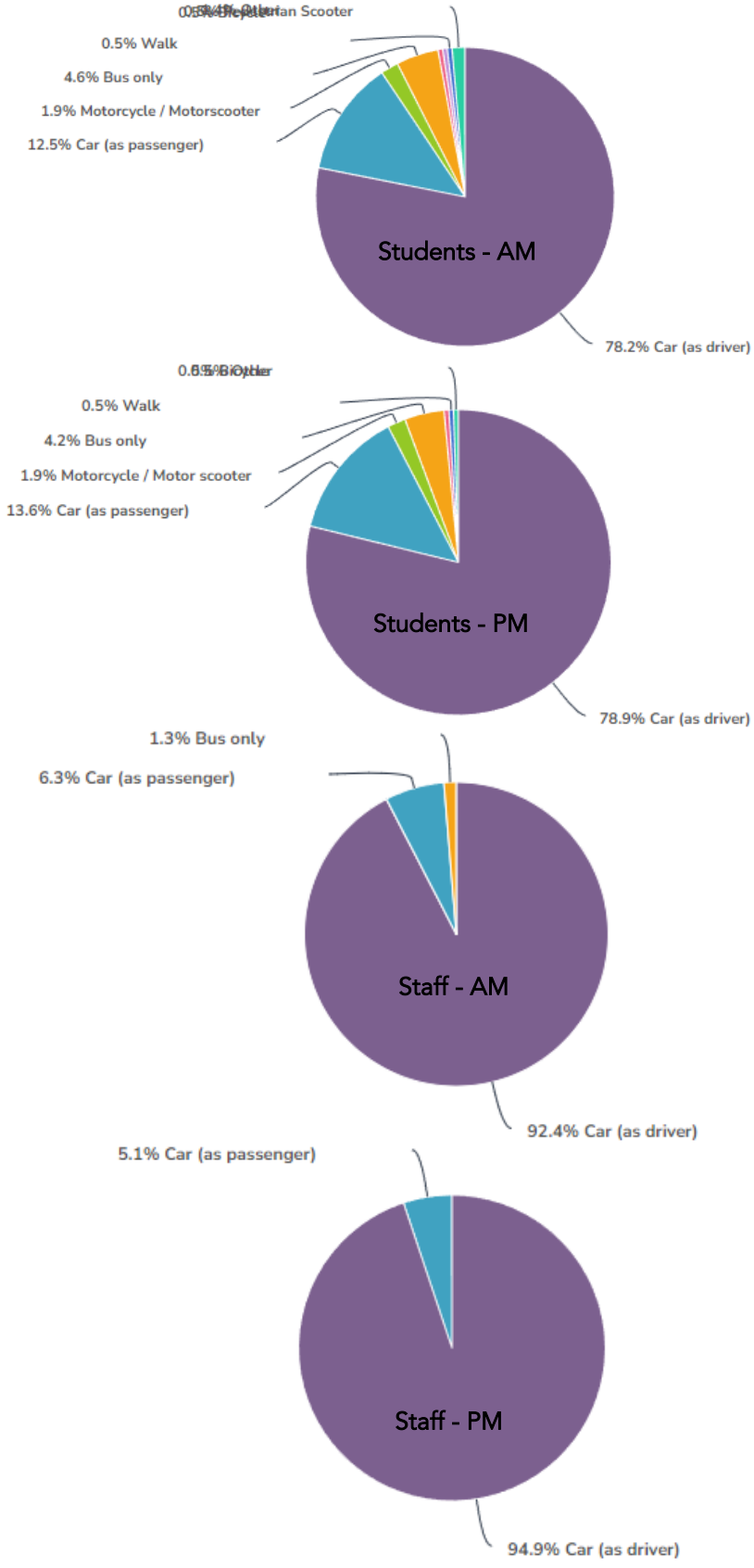


Figure 8 - Student and Staff Travel Mode - AM & PM

3.2. Traffic Surveys

Intersection surveys were undertaken on Tuesday 14th March 2023 within a non-school holiday period, to determine the existing traffic conditions within the surrounding road network servicing the campus. The following key intersections were surveyed:

1. Bruxner Highway / Sneaths Road priority-controlled intersection
2. Sneaths Road / Lismore Road roundabout
3. Sneaths Road / TAFE Wollongbar Campus Entrance priority-controlled intersection

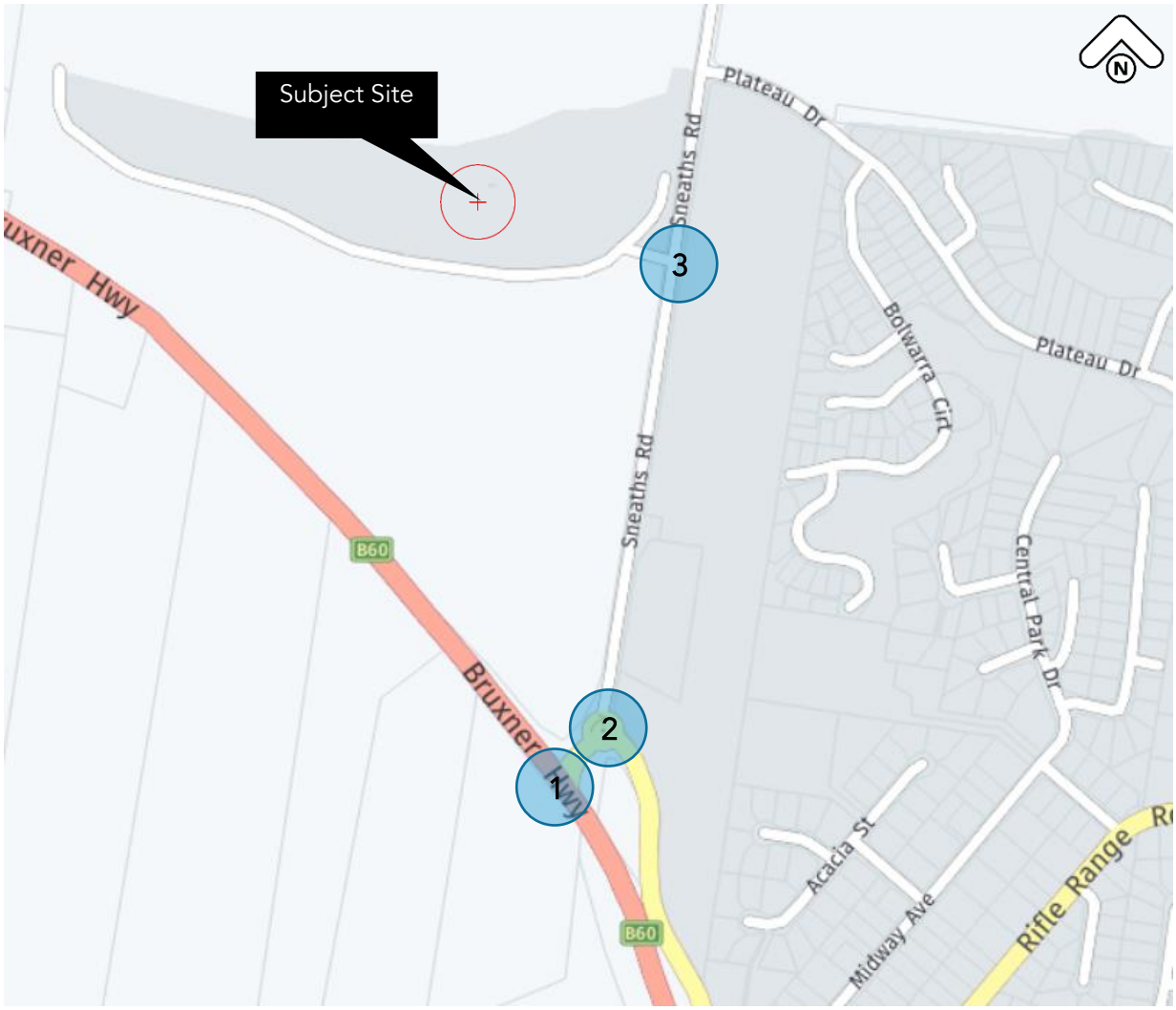


Figure 9 - Key Intersection Location Map

The campus peak hours have been determined to be between:

- 7:30am – 8:30am in the morning and
- 3:30pm – 4:30pm in the afternoon

Tube counts were undertaken in order to obtain a weekly travel patterns within the site. These were conducted for one week, starting Saturday 11th March and finishing 17th March 2023. The traffic counts were undertaken on Tuesday 14th March within the same week to obtain comparable data.

The location of the tube collection points in shown in Figure 10.

It is noted and acknowledged that the tube counts were located outside the internal Porte-cohere. This is because locating surveys between Intersection 3 and the internal roundabout would likely result in inaccurate data due to slow vehicle movements across the counters. However, the Porte-cohere accommodates a limited number of parking spaces and a pick-up / drop-off only, thus this arrangement is considered acceptable for the purpose of this report.

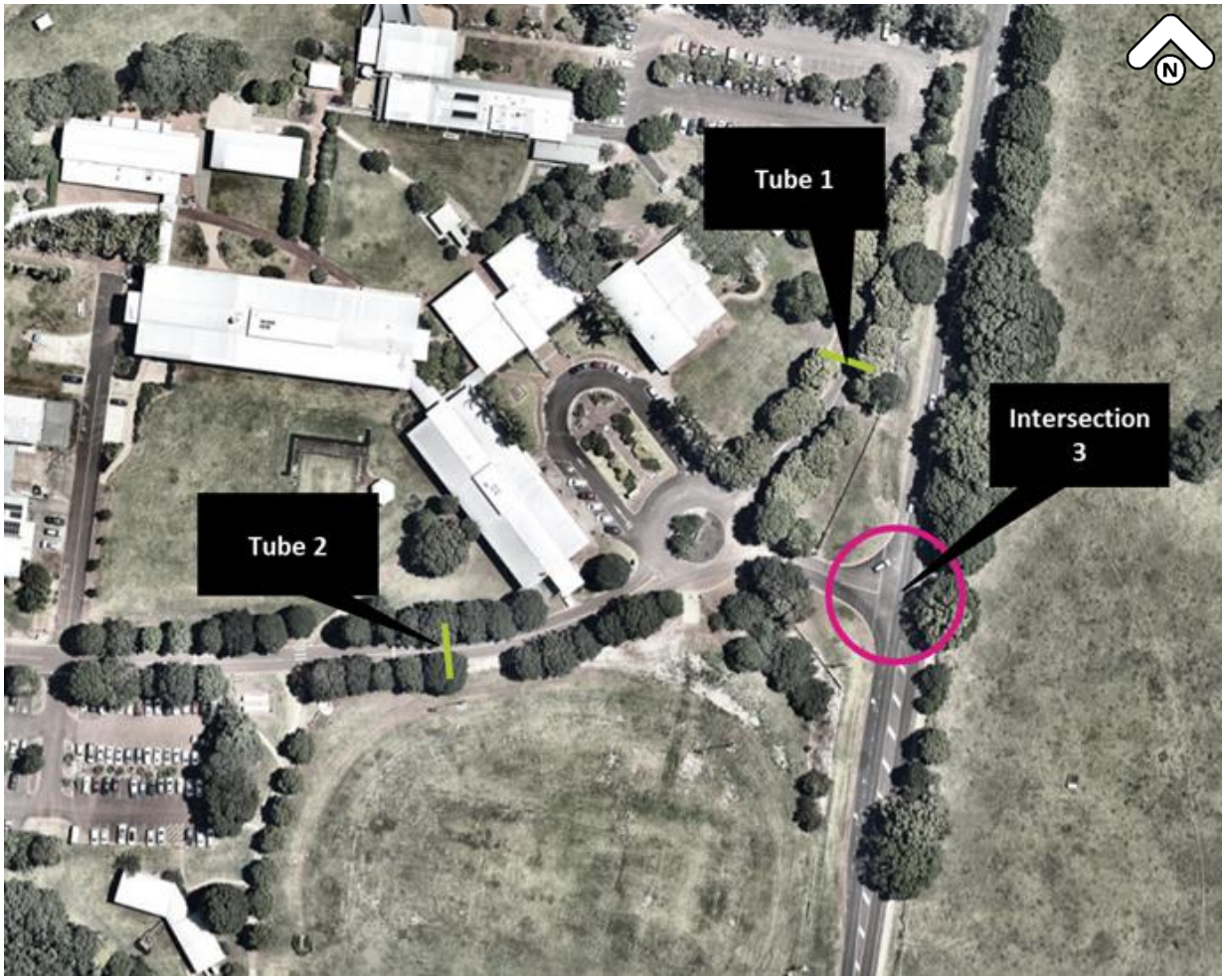
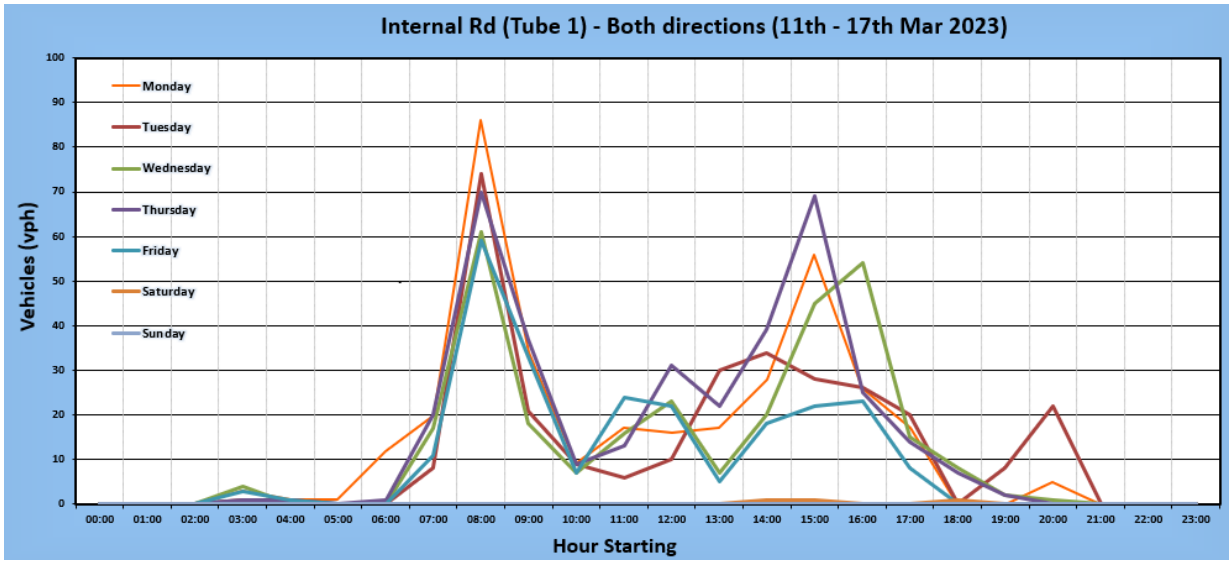


Figure 10 - Location of Tube Couts

The tube count results are shown in the following figures. The following comments are made:

- The tube count results support the peak hours determined as part of the traffic counts.
- The highest traffic volumes in the morning were recorded on Monday, which aligns with the responses received from the online survey.



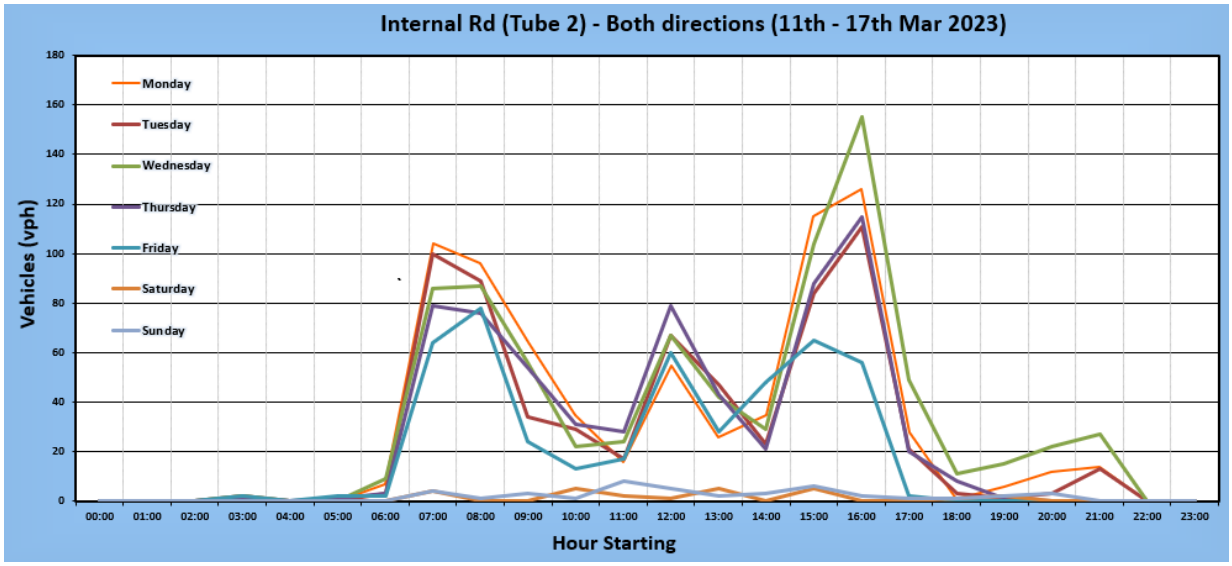


Figure 11 - Tube Count Result Charts

4. Parking Assessment

4.1. Current Parking Demand

4.1.1. Based on DCP Requirements

According to the Ballina Development Control Plan 2012, Chapter 2 – General and Environmental Considerations, Table 2.3, the following car parking provision rates are stipulated for the TAFE Wollongbar campus:

- Tertiary educational establishment
    - 1 space per 5 students plus
    - 1 space per 2 employees

The parking requirements as per the DCP for the existing staff and students at the TAFE Wollongbar campus are summarised in Table 3.

Table 3 - Current Parking Demand Based on DCP Requirements

	Current Population	Minimum Parking Provision Rate	Minimum Parking Requirement	Car Parking Provided*
Students	2,502 x 88%** = 2,202	1 space per 5 students	440	556
Staff	120	1 space per 2 employees	60	
		Total	500	556

**Current parking provision – excluding 12 pick up & drop off spaces*

***88% of student respondents of the online surveys stated that they attend the Wollongbar campus.*

The current provision of 556 spaces represents a surplus of 56 when assessed against the DCP requirements. As the DCP accounts for staff and students only, the parking surplus may be used by visitors and trades people, or may be utilised for future growth of the school.

4.1.2. Based on Surveys

The rationale for interpreting the current demand estimates and the estimated current peak weekday parking demand are shown in Table 4 below.

Table 4 - Current Parking Demand Based on Surveys

Item	Calculation for Current Parking Demand	Students	Staff	Source / Note
A	Total people who received the survey link	2,502 students	120 staff	TAFE NSW
B	% Attend Wollongbar Campus	88%	100%	Online survey; ptc. Assumption
C = A x B	**People Attending Wollongbar Campus**	**2,202 students**	**120 staff**	**ptc. Calculation**
D	% Attendance per worst day (Monday)	37%	81%	Online survey
E	% Arriving between 7am-5pm	91%	100%	Traffic survey; ptc. Assumption
F = C x D x E	**Total No. of People on worst day**	**741 students**	**97 staff**	**ptc. Calculation**
G	% Driving & Requiring Parking	73% – 83%	92%	Online survey & contingency
H = F x G	**No. of People driving & requiring parking**	**541 – 615 students**	**89 staff**	**ptc. Calculation**
I	No. of People per Car	1.10	1.05	Online survey
J = H / I	**No. of Cars per day**	**492 – 559 cars**	**85 cars**	**ptc. Calculation**
K	Space Turnover	1.20	1.00	ptc. Assumption
L = J / K	**On-Campus Parking Requirement at Peak**	**410 – 466 spaces**	**85 spaces**	**ptc. Calculation**
	Total Parking Demand	**495 – 551 spaces**		

The following is noted:

- There appears to be a surplus of 5 - 61 parking spaces based on the current parking provision and the estimated current parking demand (students + staff).
- The estimated parking demand seems to corelate to the requirement stipulated by the DCP.

Verification Check

To test the veracity of the current parking demand model on a high-level, we compared the estimated peak parking demand based on the attendance on Tuesdays with the accumulated peak parking demand from traffic surveys undertaken on a Tuesday. The validation calculation is presented below.

Table 5 - Verification Check

Verification	Calculation
Total Tuesday Parking Demand at Peak (using methodology as per Table 4)	415 - 460
Accumulated Tuesday Peak Occupancy per Traffic Survey	372
Variance	**-43 to -88**

The variance between ptc.'s parking demand model and the Tuesday peak occupancy based on traffic survey ranges from 43 to 88 spaces corresponding to 8% - 16% of total capacity. Potential reasons for the discrepancy could be as follows:

- It was not identified by the traffic surveys how many vehicles were within the site's car park prior to the 6am start of the surveys. We have assumed that 30 (fleet) vehicles occupy the car park on a permanent basis, thus reducing the number of available spaces. If more vehicles are permanently parked within the site, the capacity for staff / students would be lower.
- Low response rate of the online surveys may potentially show inflated rate for the car use, as well as skewed percentages for Items B, D, E, G and I in Table 4.
- Lower than usual attendance on the day of the traffic surveys resulting in a lower number of cars recorded to enter and exit the site.

4.2. Future Parking Demand

We have assumed that the parameters applied for the current model as per Section 4.1.2 will remain the same for the purpose of the future parking demand.

With an increase of 500 students and 27 staff, the future on-campus parking demand has been estimated to be between 608-677 spaces (503-572 for students and 105 for staff). A comparison of the future parking requirements as per the DCP and our parking demand model is shown in Table 6 below.

Table 6 - Comparison: Future Parking Requirements per DCP vs. ptc. Future Parking Demand Model

	Future Population	Minimum Parking Provision per DCP Rate	Minimum Parking Requirement per DCP	ptc. Future Parking Demand Model	Current Car Parking Provided
Students	2,202 + 500 = 2,702	1 space per 5 students	540 spaces	503-572 spaces	556
Staff	120 + 27 = 147	1 space per 2 employees	72 spaces	105 spaces	
Total			612 spaces	608-677 spaces	556 spaces

- There is an undersupply of 62 spaces between the minimum parking requirements per the DCP and the current parking provisions.
- Based on our parking demand assessment, additional 52-121 spaces may be required to accommodate additional students and staff.

5. Traffic Impact Assessment

A volume analysis has been performed using the SIDRA Intersection 9 software, a micro-analytical tool for individual intersection and whole-network modelling. The models are based on the collected traffic survey data. SIDRA provides a number of performance indicators as outlined below:

- Level of Service (LoS) – This is a categorization of average delay, intended for simple reference. It is a good indicator of overall performance for individual intersections. TfNSW adopts the following bands:

Table 7 - Intersection Performance - Levels of Service

LoS	Average Delay (secs/vehicle)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity. At signals, incidents would cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Extra capacity required	Extreme delay, major treatment required

** Note: For roundabout intersections, the average performance indicators are used. It is noted that for priority-controlled intersections, the minor road usually experiences the highest delay, whereas the major road experiences zero delay. In light of this, the average performance indicators may not be a suitable method of assessing the performance of an intersection. Therefore, the performance indicators for the worst movement have been reported for priority-controlled intersections.*

- Degree of Saturation (DoS) – The total usage of the intersection expressed as a factor of 1 with 1 representing 100% use/saturation. (e.g. 0.8=80% saturation)
- Average Delay (AD) – The average delay encountered by all vehicles passing through the intersection. It is often important to review the average delay of each approach as a side road could have a long delay time, while the large free flowing major traffic will provide an overall low average delay.
- 95% Queue Lengths (Q95) – is defined to be the queue length in metres that has only a 5-percent probability of being exceeded during the analysis time period. It transforms the average delay into measurable distance units. Generally, the highest (as opposed to average) Q95 is presented.

Typically, the SIDRA model is executed using default parameters. However, a discrepancy was identified between the SIDRA outcomes for existing traffic volumes and observations on videos of right turns from the North-East (Sneaths Road) at the intersection of Sneaths Road and Bruxer Way during peak hours. The following has been considered.

The Exiting Flow Effect refers to the percentage of right turns from road A (in this case from the North-East (Sneaths Road)) that are considered to conflict with left turns from road B (in this case from the North-West (Bruxer Highway) to the North-East (Sneaths Road)). While these movements do not

necessarily conflict, drivers making a right turn will frequently wait to ensure that left-turning vehicles are indeed turning left. A default value of 50% is commonly reasonable when the left turn is shared with through traffic. However, for this intersection, the left turn occupies a distinct lane, and the turn's radius is generous.

Therefore, the Exiting Flow Effect for the right turns from the North-East (Sneaths Road) has been adjusted from 50% to 10%.

5.1. Modelling Scenarios

An analysis has been undertaken for the following scenarios:

Existing Traffic Volumes

The existing traffic volumes have been modelled at the key intersections. This scenario includes the existing 2,202 students and 120 staff (see Table 3).

Existing traffic volumes during the morning and afternoon peak hours are shown in Appendix 2.

Background Growth Traffic Volumes

It has been assumed that the traffic volumes on the North-West and South-East approaches on Bruxner Highway will be increased by an estimated growth rate of 2% per year to account for population growth within the LGAs.

It has been assumed that the new Wollongbar campus will be opened in 2028/2029.

The future additional traffic volumes for population growth (5 years) are summarised in Appendix 2.

Future Traffic Volumes for Increased Student Number

The future scenario assumes a student increase of 500 and staff increase of 27 (see Table 6). The calculation of the additional traffic volumes is shown in Table 8 and
Table 9.

Table 8 - Future Additional Traffic Volumes for Increased Student and Staff Number

Period	Difference	% arriving per day	# attending during AM/PM peak	% travelling by car	Car Occupancy	No. of Total Vehicles
Students						
AM	500	37%	39%	91%	1.1	60
PM			51%	92%		79
Staff						
AM	27	81%	73%	99%	1.05	15
PM			51%	100%		11

Table 9 - Split of Future Additional Traffic Volumes

Period	Additional No. of Total Vehicles	% Drop-off / Pick-up	No. Drop-off / Pick-up Vehicles	No. Drivers' Vehicles
AM	75	18%	14	61
PM	90	17%	16	74

Based on results from the online surveys, 89 vehicle trips (75 inbound, 14 outbound) are estimated to be generated in the morning peak hour, and 106 (16 inbound, 90 outbound) in the afternoon peak hour by the proposed student and staff increase.

The distribution of the future students and staff traffic has been undertaken based on both the existing intersection movements (in particular at the Sneaths Road / Lismore Road & Sneaths Road / TAFE Wollongbar Campus Entrance) and at the Bruxner Highway / Sneaths Road intersection based on the likely travel direction derived from the online surveys.

The future additional traffic volumes for student and staff population increase are summarised in Appendix 2.

5.2. SIDRA Results

Results for the SIDRA model of all scenarios are shown in Table 10. For the detailed movement summaries, refer to Appendix 3.

Table 10 - SIDRA Output - Existing Traffic Volumes

Intersection	Period	Scenario	LoS	DoS (v/c)	AD (sec)	Q95 (m)
1.Bruxner Highway / Sneaths Road	AM Peak	Existing	A	0.853	5.9	61.2
		Background growth	A	0.985	10.1	114.3
		Future	A	1.036	13.7	114.3
	PM Peak	Existing	A	0.707	4.6	39.6
		Background growth	A	0.794	5.2	50.0
		Future	A	0.899	7.2	80.7
2. Sneaths Road / Lismore Road	AM Peak	Existing	A	0.317	6.0	12.3
		Background growth	A	0.317	6.0	12.3
		Future	A	0.356	5.9	30.2
	PM Peak	Existing	A	0.312	6.9	12.6
		Background growth	A	0.312	6.9	12.6
		Future	A	0.427	7.2	16.8
3. Sneaths Road / TAFE Wollongbar Campus Entrance	AM Peak	Existing	A	0.084	4.0	1.4
		Background growth	A	0.084	4.0	1.4
		Future	A	0.118	4.5	2.1
	PM Peak	Existing	A	0.301	5.2	10.2
		Background growth	A	0.301	5.2	10.2
		Future	A	0.414	5.6	15.8

Sneaths Road / Lismore Road & Sneaths Road / TAFE Wollongbar Campus Entrance

The LoS at both intersections is A in both the morning and afternoon peak hours, and the spare capacity ranges between 91% and 59%.

The proposed increase in student and staff numbers can be easily accommodated at these two intersections.

Bruxner Highway / Sneaths Road

While the overall LoS is A during both morning and afternoon peak hours, the DoS indicates that there is little spare capacity. With 0.853 v/c in the existing scenario, this intersection is at a tipping point already. This is strengthened by the fact that the DoS increases to 0.985 when adding just the background traffic growth.

The most affected turn movement is the right turn from Sneaths Road into Bruxner Highway during the AM peak hour, for which SIDRA results for all scenarios are shown in Table 11. It is the background growth which results in the LoS to change from D to F, with the proposed uplift of population further increasing the Average Delay.

Table 11 - SIDRA Output - Right turn from Sneaths Road into Bruxner Highway

Turn Movement	Period	Scenario	LoS	DoS (v/c)	AD (sec)	Q95 (m)
Right turn from Sneaths Road into Bruxner Highway	AM Peak	Existing	D	0.853	30.7	61.2
		Background growth	F	0.985	66.1	114.3
		Future	F	1.036	92.4	114.3

Based on this analysis, it is considered that the proposal is not likely to have a negative impact on the surrounding road network as such. However, TfNSW may indicate that upgrades to this intersection are required purely on the merit that the intersection is already close to its capacity. Therefore, it is recommended that some research be undertaken on any planned upgrades of the Bruxner Highway / Sneaths Road intersection to a signalised intersection, as this is likely to alleviate the existing concerns.

6. Conclusion and Recommendations

ptc. have been engaged by TAFE NSW to undertake a due diligence traffic and parking assessment for the potential expansion of the Wollongbar Campus.

It is understood that the potential student increase has not been defined yet, but that there are considerations of around 500. Therefore, an increase of 500 students, and an equivalent proportion of staff (27) has been adopted for the purpose of parking and traffic modelling.

The enrolment catchment of the campus is large given its rural location and type of educational facility, thus walking and cycling are not considered to be viable transport options for many students and staff. Walking and cycling may be viable for neighbouring towns, though the active transport infrastructure has been found to have gaps, particularly across the campus's frontage roads.

Public transport options are limited around the campus, thus not many students and staff are able to use it.

Online surveys were undertaken to gain an understanding of the current travel behaviour of staff and students. While many staff responded to the survey, the response rate amongst students was low and therefore, the results may not be accurate. However, it was found that the main transport mode used by both staff and students is private vehicle. Some have indicated that they would use public transport if more convenient and frequent services were available.

A parking analysis was conducted based on the local DCP as well as based on input received through the online surveys. It was found that the calculated parking demand is in-line or slightly higher than based on the DCP requirements. Further, the existing calculated parking demand is at the level of the current provision. With the proposed student and staff increase, at least 50 parking spaces will be required to satisfy both the DCP and the calculated parking demand.

Traffic surveys were undertaken, and their results used as a basis for traffic modelling. The SIDRA model shows that whilst the Level of Service remains overall at an A for all intersections and during both the AM and PM peak hours, the right turn movement from Sneaths Road is close to capacity. The modelling showed that it is the background growth which increases the Level of Service from D to F and that the proposal is likely to have a negligible impact on the surrounding road network.

Based on the study and points made above, the following considerations and recommendations are made:

- Given the low response rate of the online surveys, new surveys may need to be undertaken for future DAs. Knowing of the difficulties around student engagement, other methods could be explored (ex. Intercept surveys).
- TAFE NSW could undertake early consultation with TfNSW and work with the authority to implement additional bus routes and services. This may reduce car use amongst staff and students.
- It is recommended to obtain and review the latest development application documentation to understand the current status on the existing parking requirements.
- It is considered that the proposal is not likely to have a negative impact on the surrounding road network as such. However, TfNSW may indicate that upgrades to this intersection are required purely on the merit that the intersection is already close to its capacity. Therefore, it is

recommended that some research be undertaken on any planned upgrades of the Bruxner Highway / Sneaths Road intersection to a signalised intersection, as this would likely alleviate the existing concerns.

7. Limits of this Report

All surveys, forecasts and recommendations have been made in good faith and on the basis of the information available to ptc. at the time of writing this report.

We note that traffic surveys were limited to one weekday and tube counts to a period of one week; it was assumed that the results obtained are representative of normal operations. We should also note that this report is limited by the fact that the response rate of the travel mode survey was low, thus some inaccuracies are expected. The findings presented here may not fully capture the nuances of student and staff behaviour in relation to these factors.

As a result, the conclusions drawn from this report should be interpreted within the context of these limitations.

Where general data has been applied based on other car parks / experience, there is the need to recognise the fact that each car park is to some extent unique, particularly regarding driving habits, sensitivity to parking prices, alternative means of transport, available free parking on street, demographics of the area etc.

Appendix 1. Travel Mode Survey Results

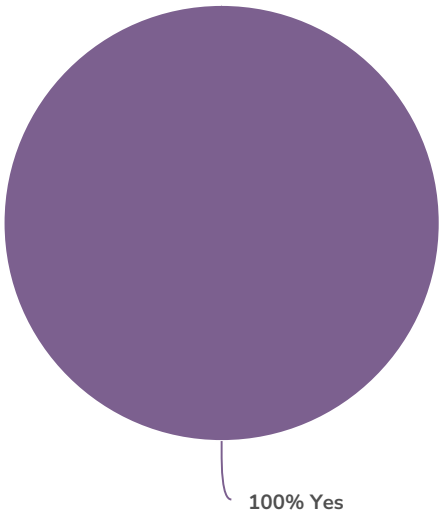
This report is filtered
Only show: #1 Question "Do you attend the TAFE NSW Wollongbar campus as part of your work/studies?" is one of the following answers ("Yes","No") and #2 Question "Are you staff or student?" is one of the following answers ("Student")

Appendix 1 - TAFE NSW Wollongbar Campus Travel Mode Survey Reports - Students

Response Counts

Completion Rate:	**89.9%**		
	Complete		195
	Partial		22
			Totals: 217

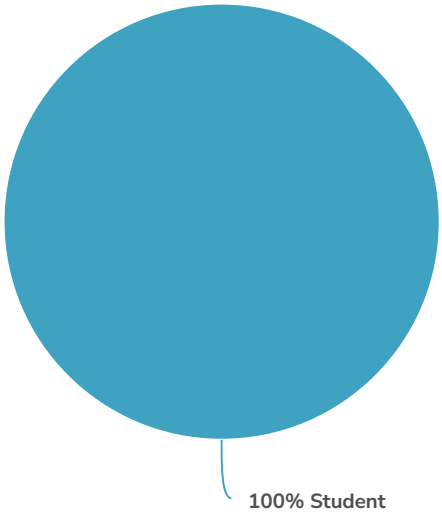
1. Do you attend the TAFE NSW Wollongbar campus as part of your work/studies?



Value	Percent	Responses
Yes	100.0%	217

Totals: 217

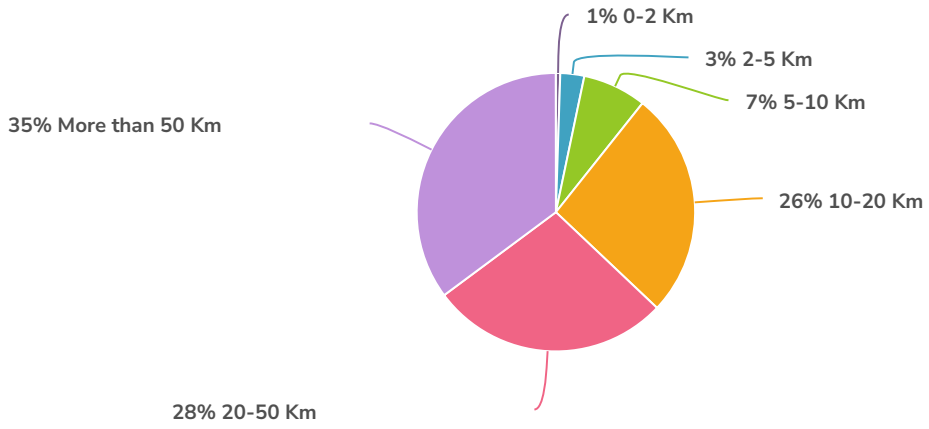
2. Are you staff or student?



Value	Percent	Responses
Student	100.0%	217

Totals: 217

3. How far do you normally travel from your home to the TAFE NSW Wollongbar campus?



Value	Percent	Responses
0-2 Km	0.5%	1
2-5 Km	2.8%	6
5-10 Km	7.4%	16
10-20 Km	26.4%	57
20-50 Km	27.8%	60
More than 50 Km	35.2%	76

Totals: 216

4. Which is your nearest town centre?

ResponseID	Response
64	Ballina
65	Lismore
66	Lismore
67	Lismore
69	Pottsville Beach
70	Lismore
71	Lennox head
72	Kyogle Nsw
73	Kingscliff nsw
74	Lismore
75	Kingscliff NSW
76	maclean
77	Grafton
78	Wardell
80	Tweed heads
81	Grafton
85	Tenterfield
87	lismore
88	Murwillumbah
89	Ballina
90	Lismore
91	Murwillumbah
92	GOONELLABAH

ResponseID	Response
93	Lismore
94	Lismore
95	Casino
96	Lismore
97	Casino 2470
98	Ballina
99	Casino
101	Wetherill park
102	Gulmarrad
103	tintenbar
105	Maclean 2463
106	Ballina
107	ocean shores
108	Casino
110	Kyogle
111	nimbin
115	Pottsville
116	Lismore
117	Goonellabah
118	Casino
120	Tweed city
121	Ballina
122	Bexhill
123	Murwillumbah

ResponseID	Response
124	Murwillumbah
126	Lismore
128	Wollongbar
129	Murwillumbah
130	Lismore
131	Kyogle
132	Wollongbar
135	Casino nsw
136	Casino
137	Tenterfield
138	Lismore
140	Maclean iga
144	Casino
145	Woodburn
146	Casino
147	Tweed Heads South
148	Ballina
150	Kingscliff
151	Muswellbrook
155	Wollongbar
156	Casino
158	Ballina
159	casino
160	Lismore

ResponseID	Response
162	Alstonville
163	Evans Head
164	Casino
165	Lismore
166	Tweed heads
167	Ocean Shores
168	lismore
170	Lismore
171	Yamba
172	Casino
173	Casino
174	Lismore
175	Wollongbar
176	Alstonville
178	Goonellabah
179	Lismore
180	Banora point
182	Ballina
183	ballina
184	ballina
185	Ballina
186	Casino
187	Evans head
188	Kingscliff

ResponseID	Response
189	Ballina
191	Grafton NSW
192	Ballina
193	Lismore
194	Kingscliff
195	lismore
196	Alstonville
198	Ballina
200	Casino
201	Ballina
202	Kyogle
203	Kyogle
204	Tenterfield
205	Ballina
206	Lismore
207	Alstonville
208	Lismore
209	Goonellabah
210	Casino
211	Alstonville
214	Maclean
216	Lusmore
217	Kingscliff
218	Alstonville

ResponseID	Response
221	Cudgen
222	Goonelabah
224	Lismore
225	Tweed heads
226	Lennox Head
227	Stanthorpe
228	Armidale
229	Lennox head
230	Maclean
232	Tweed Heads
233	Ballina
234	Lismore 2480
236	Casino
237	Alstonville
238	Ballina
239	ocean shores
241	Ocean shores
242	lismore
243	Lismore
244	Wollongbar
245	Burringbar
247	Evans head
248	Casino
249	Bangalow

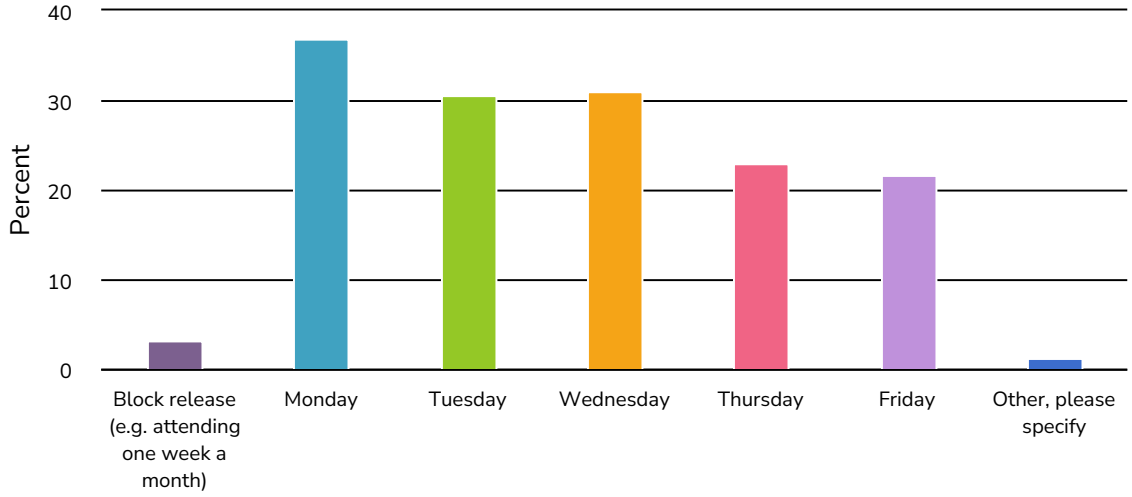
ResponseID	Response
250	Lismore
251	Maclean
255	Mullumbimby
256	Alstonville
257	Casino cbd
270	North Lismore
272	Ballina
274	Ballina
275	Wollongbar
278	Byron bay
279	Bangalow
281	Casino
282	Lismore
283	Casino
304	TEST ONLY
306	Casino
308	Lismore
309	Alstonville
311	Byron bay
313	Wiangaree
314	Byron Bay
315	Goonellabah
319	Lismore
320	Unsure

ResponseID	Response
321	Casino
322	Maclean
326	Lismore
327	Ballina
329	Goonellabah
330	Ballina
332	Lismore
334	Alstonville Plaza
335	Banora Point
336	Newrybar
337	Ballina
338	Lismore
340	Kingscliff
341	Lennox Head
343	Alstonville
344	Lennox Head
347	Casino
348	Clunes
349	Lismore
351	Kingscliff nsw
352	Alstonville
353	grafton
354	Lismore
355	Ballina

ResponseID	Response
358	ballina
360	Lismore
363	Ballina
366	Alstonville NSW 2477
368	Yamba
369	lismore
370	alstonville
371	Casino
373	lismore
374	Maclean
375	Ballina
377	Lismore
379	Alstonville
380	Coraki
381	Lennox Head
382	Lismore
383	Lismore
384	Murwillumbah
385	Lismore
386	Suffolk Park
391	Ballina
392	Wardell
394	Lismore
395	Lismore

ResponseID	Response
397	Ballina

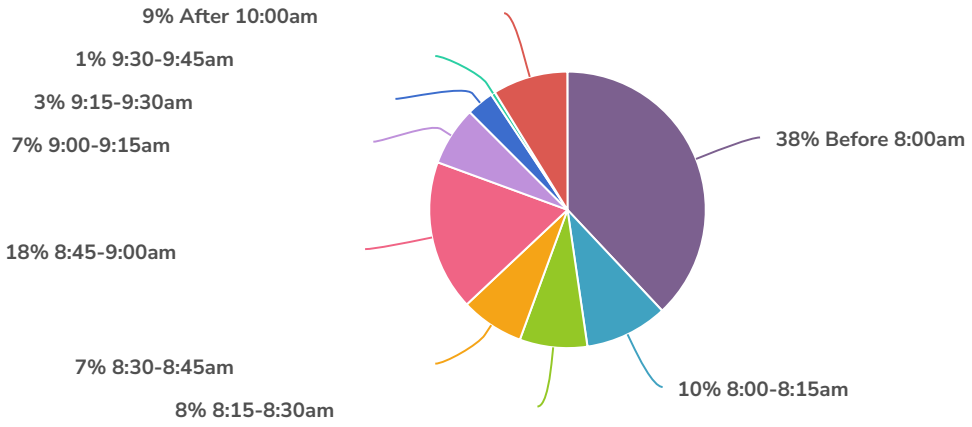
5. Which days do you normally attend the TAFE NSW Wollongbar campus (tick all that apply)



Value	Percent	Responses
Block release (e.g. attending one week a month)	3.2%	7
Monday	37.0%	80
Tuesday	30.6%	66
Wednesday	31.0%	67
Thursday	23.1%	50
Friday	21.8%	47
Other, please specify	1.4%	3

Other, please specify	Count
Days short course are booked as well	1
Only when I have a training course	1
Three days	1
Totals	3

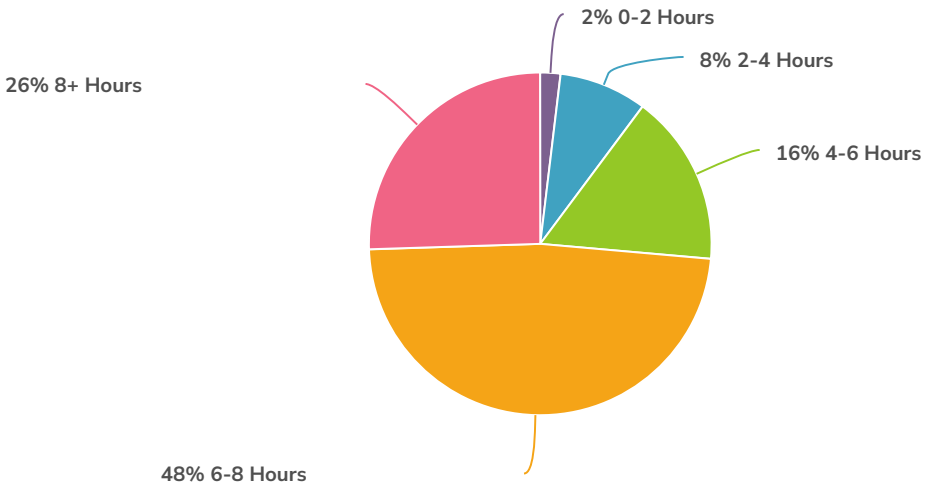
6. What time do you arrive at the campus on a typical day?



Value	Percent	Responses
Before 8:00am	38.0%	82
8:00-8:15am	9.7%	21
8:15-8:30am	7.9%	17
8:30-8:45am	7.4%	16
8:45-9:00am	17.6%	38
9:00-9:15am	6.9%	15
9:15-9:30am	3.2%	7
9:30-9:45am	0.5%	1
After 10:00am	8.8%	19

Totals: 216

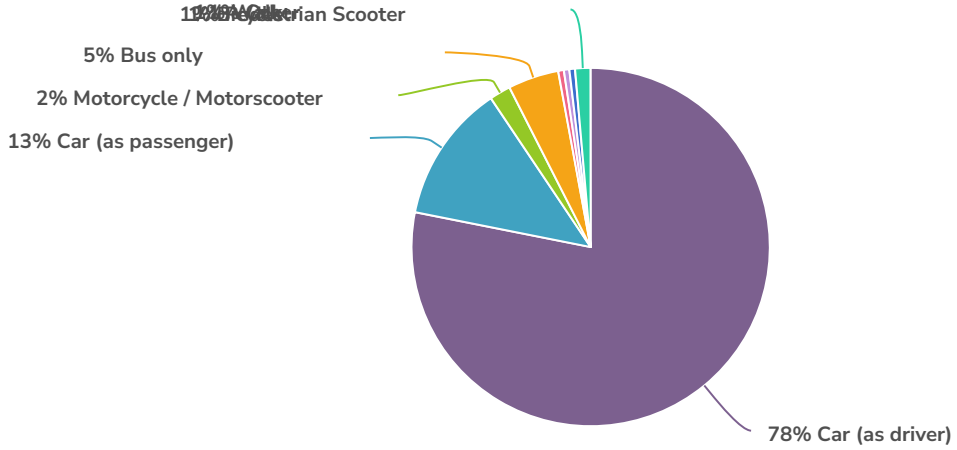
7. How long do you stay on campus during a typical day?



Value	Percent	Responses
0-2 Hours	1.9%	4
2-4 Hours	8.3%	18
4-6 Hours	16.2%	35
6-8 Hours	48.1%	104
8+ Hours	25.5%	55

Totals: 216

8. How do you travel TO the campus on a typical day?



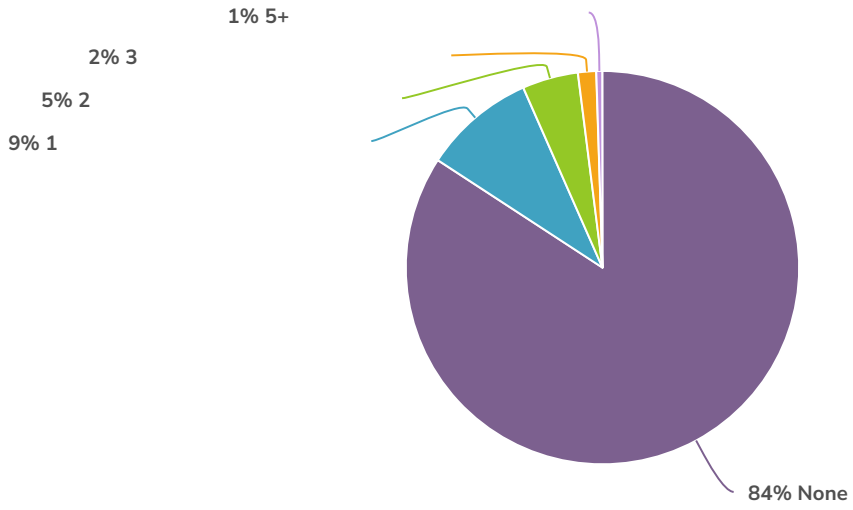
Value	Percent	Responses
Car (as driver)	78.2%	169
Car (as passenger)	12.5%	27
Motorcycle / Motorscooter	1.9%	4
Bus only	4.6%	10
Bicycle	0.5%	1
Pedestrian Scooter	0.5%	1
Walk	0.5%	1
Other	1.4%	3

Totals: 216

Bus only	Count
661	5
56	1
661,683	1
670,661	1
86	1
Casino to Lismore 670 , Lismore to wollongbar 661	1
Totals	10

Other	Count
Car share one day and drive myself the next day	1
I do virtual learning	1
Learner driver	1
Totals	3

9. How many other TAFE NSW Wollongbar students travel with you?



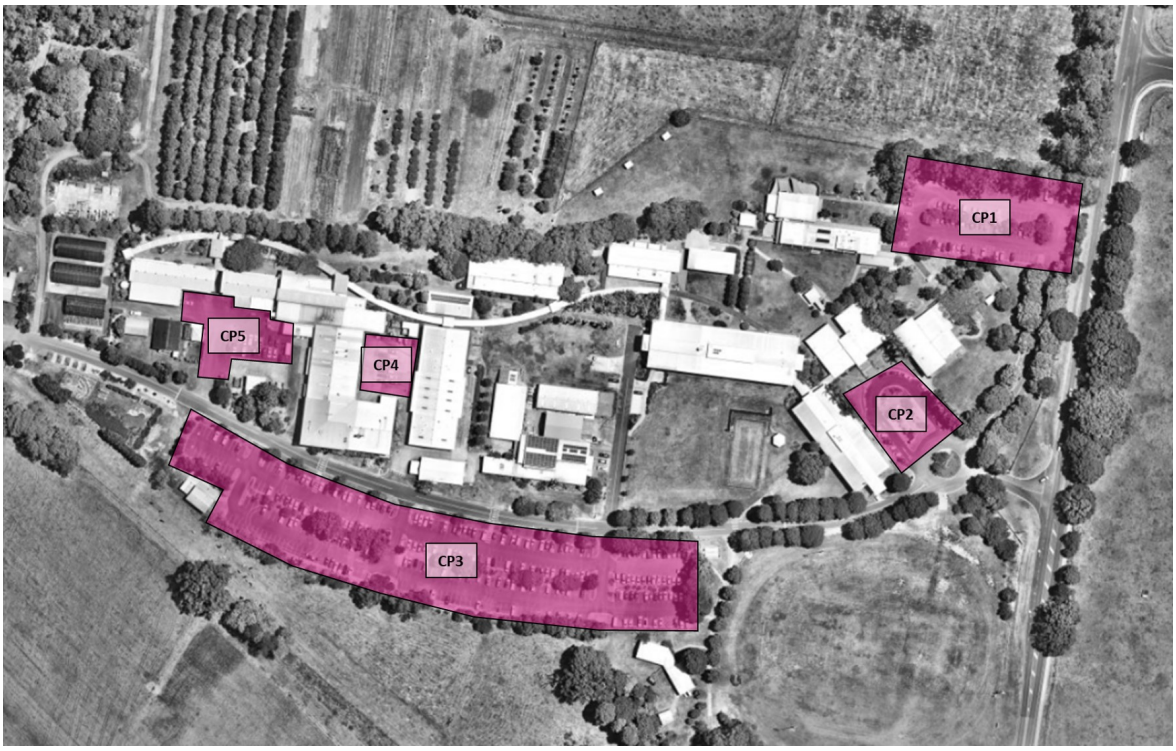
Value	Percent	Responses
None	84.2%	165
1	9.2%	18
2	4.6%	9
3	1.5%	3
5+	0.5%	1

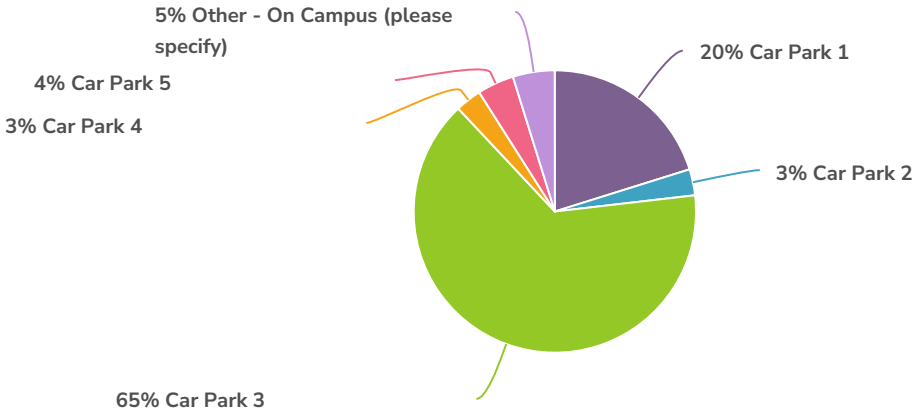
Totals: 196

10. How many other TAFE NSW Wollongbar staff travel with you?

No data to display

11. Where do you usually park?





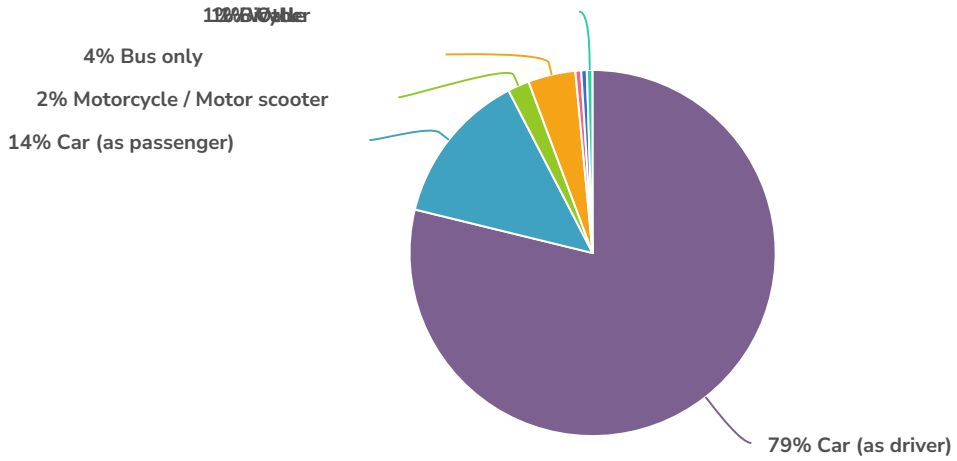
Value	Percent	Responses
Car Park 1	20.2%	34
Car Park 2	3.0%	5
Car Park 3	64.9%	109
Car Park 4	3.0%	5
Car Park 5	4.2%	7
Other - On Campus (please specify)	4.8%	8

Totals: 168

Other - On Campus (please specify)	Count
Z block	4
Disability Parking	1
Parking at the plumbing section	1
Wheel chair parking (disabled)	1
Zblock	1
Totals	8

Other - Off Campus (please specify)	Count
Totals	0

12. How do you travel FROM the campus on a typical day?



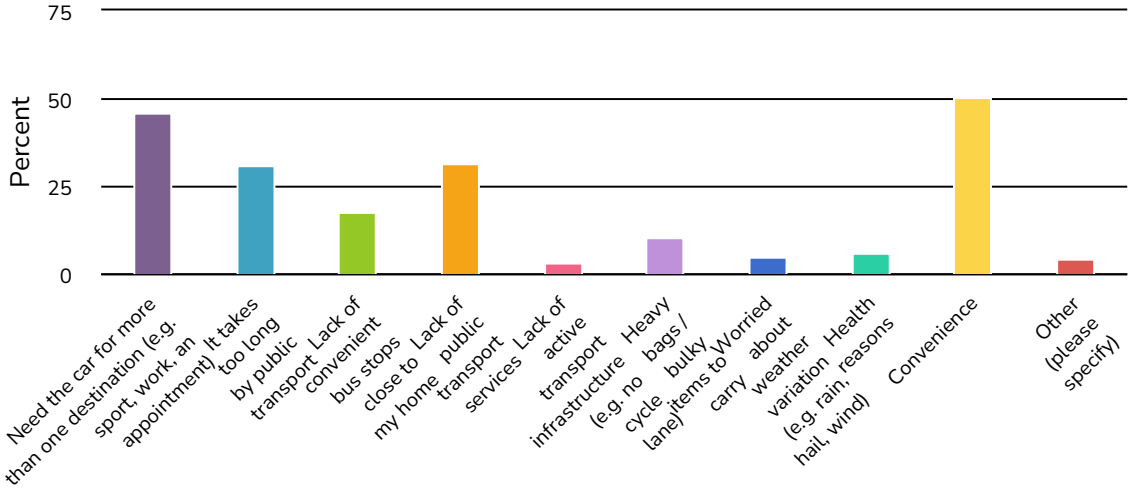
Value	Percent	Responses
Car (as driver)	78.9%	168
Car (as passenger)	13.6%	29
Motorcycle / Motor scooter	1.9%	4
Bus only	4.2%	9
Bicycle	0.5%	1
Walk	0.5%	1
Other	0.5%	1

Totals: 213

Bus only	Count
661	3
611	1
661,670	1
661,683	1
686	1
690	1
Ballina to Lismore 661, Lismore to casino 670	1
Totals	9

Other	Count
Fly	1
Totals	1

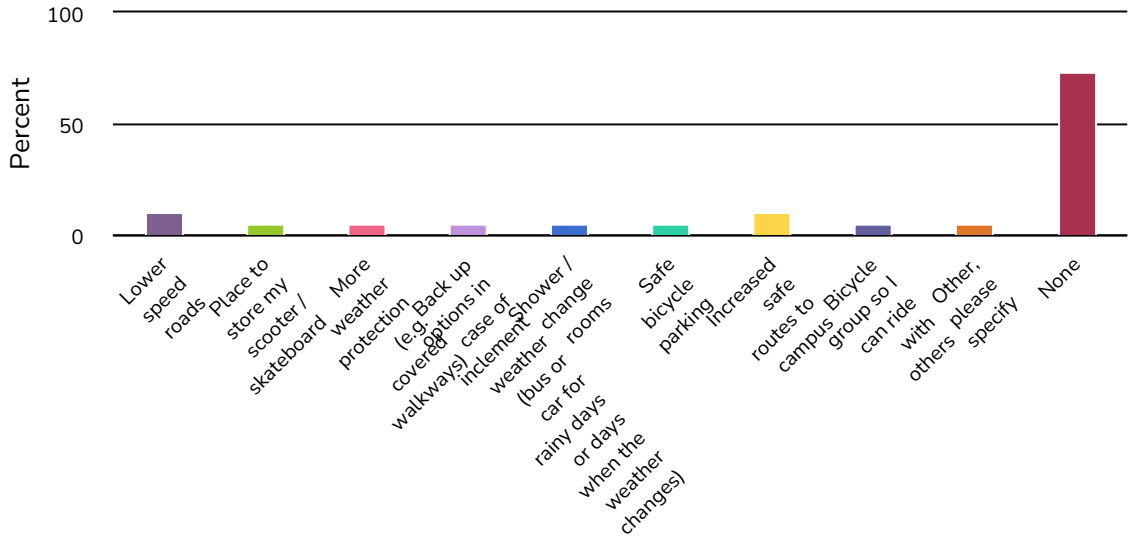
13. Why is car your preferred method of transport to / from school? (Please tick up to 3 options that apply)



Value	Percent	Responses
Need the car for more than one destination (e.g. sport, work, an appointment)	46.1%	88
It takes too long by public transport	30.9%	59
Lack of convenient bus stops close to my home	17.8%	34
Lack of public transport services	31.4%	60
Lack of active transport infrastructure (e.g. no cycle lane)	3.1%	6
Heavy bags / bulky items to carry	10.5%	20
Worried about weather variation (e.g. rain, hail, wind)	5.2%	10
Health reasons	6.3%	12
Convenience	50.8%	97
Other (please specify)	4.2%	8

Other (please specify)	Count
All of the above	1
Bus driver doesn't accept tafe free passes or bus passes	1
Covid	1
Don't have a licence yet, my parents drive me	1
I have 3 children , a license and a car to drive without needed to rely on other people	1
I live too far away	1
Other students need my to take them there as they are younger with no license	1
Timing of bus services	1
Totals	8

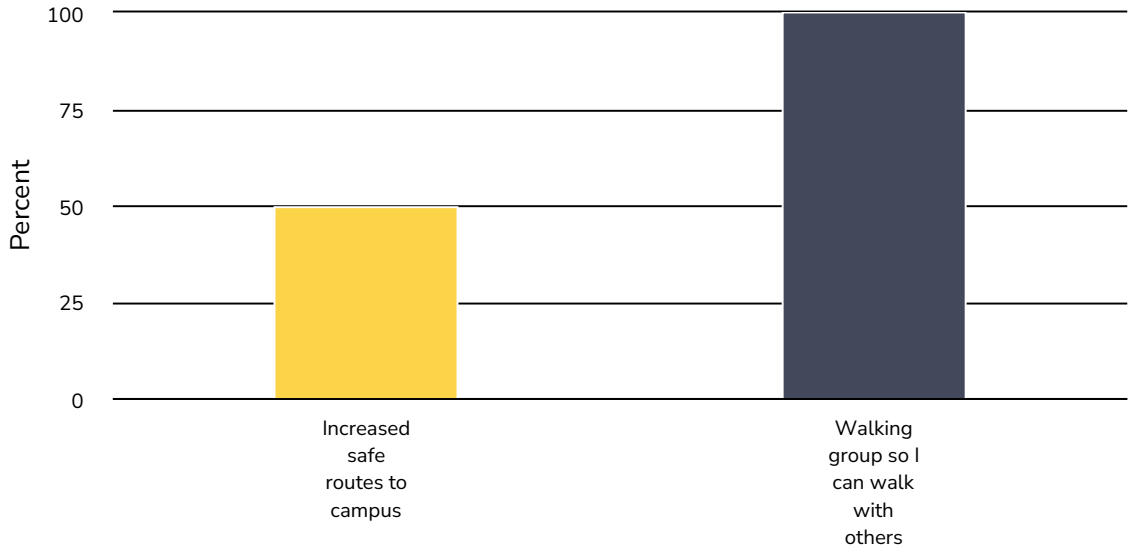
14. Which measures would encourage you to walk or cycle? (tick up to 3 options that apply)



Value	Percent	Responses
Lower speed roads	10.5%	2
Place to store my scooter / skateboard	5.3%	1
More weather protection (e.g. covered walkways)	5.3%	1
Back up options in case of inclement weather (bus or car for rainy days or days when the weather changes)	5.3%	1
Shower / change rooms	5.3%	1
Safe bicycle parking	5.3%	1
Increased safe routes to campus	10.5%	2
Bicycle group so I can ride with others	5.3%	1
Other, please specify	5.3%	1
None	73.7%	14

Other, please specify	Count
no steep hills	1
Totals	1

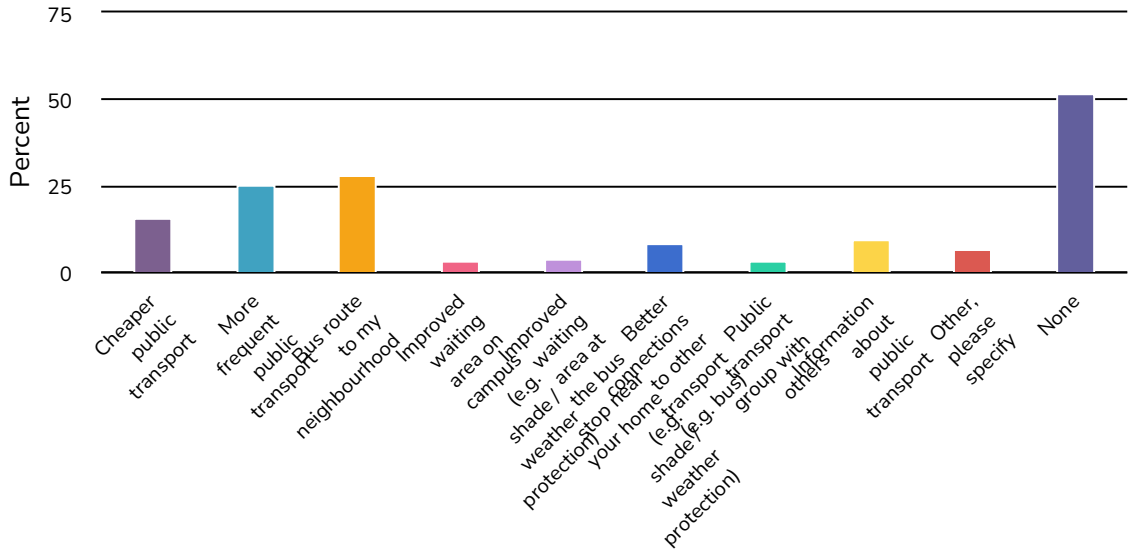
15. As you walk / cycle, what measures would you like to see more? (tick up to 3 options that apply)



Value	Percent	Responses
Increased safe routes to campus	50.0%	1
Walking group so I can walk with others	100.0%	2

Other, please specify	Count
Totals	0

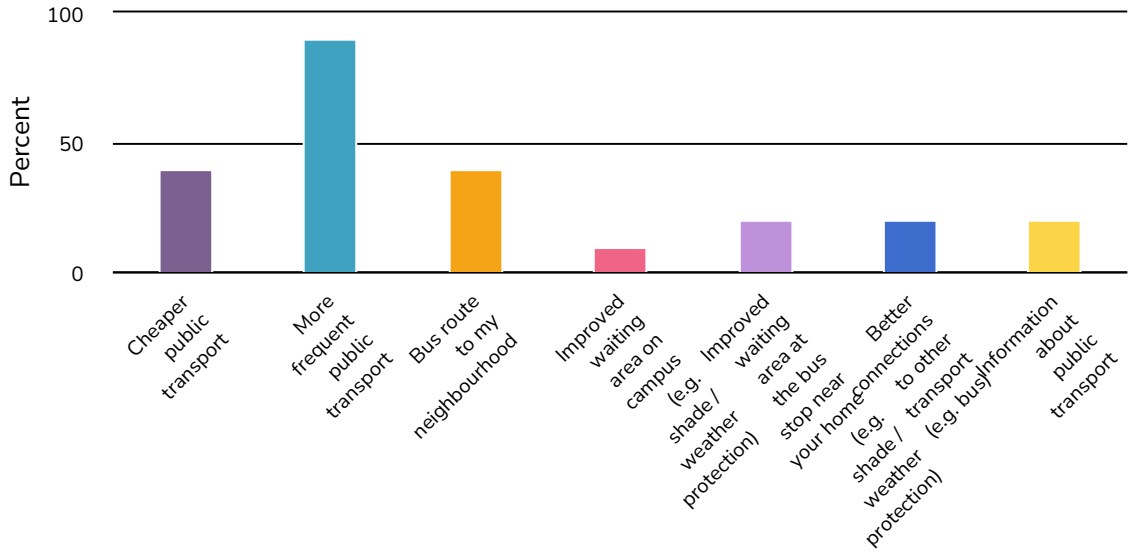
16. Which measures would encourage you to use public transport? (tick up to 3 options that apply)



Value	Percent	Responses
Cheaper public transport	15.8%	29
More frequent public transport	25.5%	47
Bus route to my neighbourhood	28.3%	52
Improved waiting area on campus (e.g. shade / weather protection)	3.3%	6
Improved waiting area at the bus stop near your home (e.g. shade / weather protection)	3.8%	7
Better connections to other transport (e.g. bus)	8.7%	16
Public transport group with others	3.3%	6
Information about public transport	9.8%	18
Other, please specify	6.5%	12
None	51.6%	95

Other, please specify	Count
A Tafe that is closer that offers my course	1
A mini bus style of transport would be preferable	1
A train since I travel so far	1
Almost no public transport in area.	1
Bus takes 3 hours for a 1 hour drive, takes 6 hours a day to public transport to Wollongbar from Kingscliff	1
Car transport is the only viable option	1
None because of safety!	1
Probably none because it's about an hour drive	1
Running Electrotechnology Cert III in Murwillumbah	1
Rural Bus routes	1
There is no viable public transport between Mty place and TAFE	1
Timely public transport; my class is in the evenings	1
Totals	12

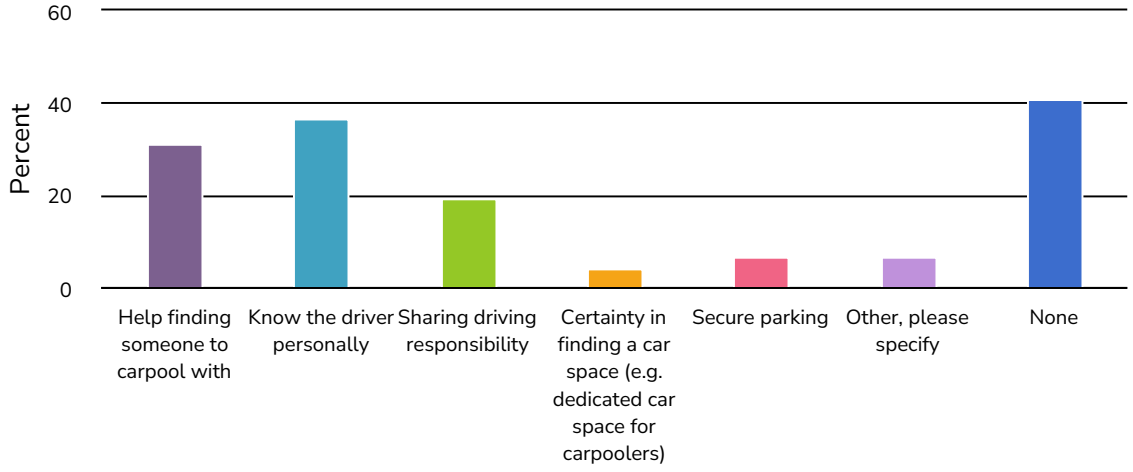
17. As you use public transport, what would you like to see more? (tick up to 3 options that apply)



Value	Percent	Responses
Cheaper public transport	40.0%	4
More frequent public transport	90.0%	9
Bus route to my neighbourhood	40.0%	4
Improved waiting area on campus (e.g. shade / weather protection)	10.0%	1
Improved waiting area at the bus stop near your home (e.g. shade / weather protection)	20.0%	2
Better connections to other transport (e.g. bus)	20.0%	2
Information about public transport	20.0%	2

Other, please specify	Count
Totals	0

18. Which measures would encourage you to carpool? (tick up to 3 options that apply)



Value	Percent	Responses
Help finding someone to carpool with	31.3%	51
Know the driver personally	36.8%	60
Sharing driving responsibility	19.6%	32
Certainty in finding a car space (e.g. dedicated car space for carpoolers)	4.3%	7
Secure parking	6.7%	11
Other, please specify	6.7%	11
None	41.1%	67

Other, please specify	Count
Completing same course and have same time at tafe	1
Having room in the vechile	1
Having someone in my class to car pool with	1
Having someone who attends tafe on the same day and in my neighbourhood	1
I already carpool, just I'm usually the driver	1
I already do	1
I do car pool	1
No one live anywhere near me	1
No one lives near me which makes it hard to carpool	1
None one lives near me	1
There are no other students in my area to arrange car pooling	1
Totals	11

19. Do you have any other transport feedback for our team?

ResponseID	Response
66	We need more lights on pathways to car parks for nights! The path we walk on after 8pm has no lights.
67	No
69	I have family that live in wardell and lismore that I visit after tafe. That's why I choose to drive by myself
74	Speed bumps into cp1 are broken
76	no
85	No
93	No
98	No
99	No buses run as late as we need them for night time classes.
103	dad/mum
107	No
110	Travel allowance from tafe should be less about kms and where you live instead.
117	None
121	n/a
123	No
130	Nope
135	No
136	I sent a travel incentive form 12 months ago and received nothing in return.
145	No
147	Not really, I don't think it should be your responsibility to be honest. There should be more government or private trade transport options available in the Northern Rivers. It's a travesty
148	No

ResponseID	Response
151	Not really
164	no
165	No
166	No
171	No
172	No
175	Nope
178	Maintenance and upkeep of car park infrastructure. Shade or undercover parking.
191	No
192	Nope
194	To far away for public transport
195	yes! i prefer the lismore cbd campus because i can walk the 3.5km there and back home. i hope the cbd campus opens again. driving to wollongbar was a real disadvantage, i lost my daily exercise and ended up sitting for most of the day, very unhealthy. dafe walking/cycling paths along the bruxner will be an inducement to get out of the car
200	No
201	No
204	No
205	The campus bus shelter is a little antiquated and doesn't adequately support the shelter of more than six waiting passengers.
208	No
209	To make finding bud times easier and more times.
216	No
222	No
230	No
241	No

ResponseID	Response
247	Potato
248	No
250	Only the very occasional car ride with someone. I'm only at TAFE face to face for three weeks as I've been doing online (I'm from Townsville Queensland).
274	All good for me at the times I attend
278	There's no public transport from Byron Bay to Wollongbar
281	No
283	No all good.
308	Maintenance and upkeep. Shade or solar panel shade options. Electric vehicle charging port.
309	Unfortunately with the way the roads are and the lack of public transport I. This area the only option is to drive. I would love to be able to cycle.
313	Luckily my teacher allowed me to arrive late and leave early, so I could get my kids to and from school. Otherwise I would not have been able to study....
314	No
326	We live in a rural area. Without our own transport we are the mercy of others.
327	No
330	No
335	Fuel vouchers for people who lives far away.
336	There is not enough buses to the campus. I was getting a lift at 7am to get to class at 9am
341	No
343	Nope!
352	I would not carpool as I drop my children to school on the way to TAFE
363	No
366	no

ResponseID	Response
373	It's a very one sided system. Why is it that people travelling over 50km each way get compensation for the travel cost but any of us that travel even half a kilometre less aren't eligible for any subsidy or incentive. Please explain why this is an acceptable model...
379	Encouraging people to be prepared for the course they attend - optional packed lunch, water bottle, having had a good night sleep before attending and leaving early to travel to Tafe in case of traffic, roadworks or anything unforseen.
380	Only one bus each day if missed don't attend always late for class
382	Not really
383	No
384	No
386	The region is poorly served by public transport. Getting to and from transport hubs makes it difficult to use. I had to buy a car to finish my course otherwise I would have had to withdraw from the course.
391	Perhaps more shaded areas to park under? At Wollongbar campus (park 3) The car park tends to get extremely hot during the summer, so much so that it was causing my study equipment to warp out of shape (design rulers) and It doesn't feel secure to leave gaps in car door windows to reduce the heat.
394	Our bus driver does not accept the free passes tafe gives out or the bus passes we can use for our morning bus

This report is filtered
Only show: #1 Question "Do you attend the TAFE NSW Wollongbar campus as part of your work/studies?" is one of the following answers ("Yes","No") and #2 Question "Are you staff or student?" is one of the following answers ("Staff")

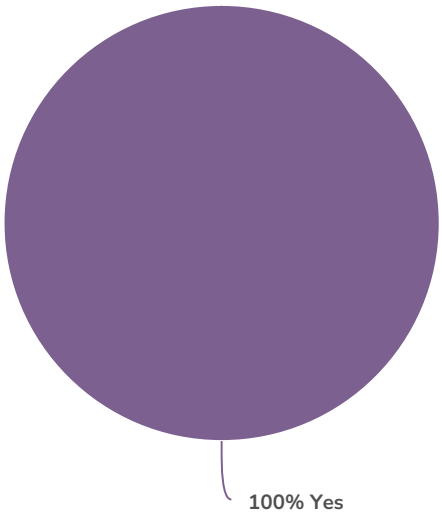
Appendix 1 - TAFE NSW Wollongbar Campus Travel Mode Survey Reports - Staff

Response Counts

Completion Rate:	**97.5%**		
	Complete		77
	Partial		2

Totals: 79

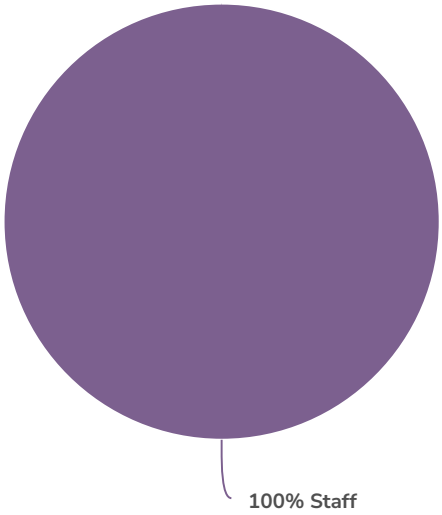
1. Do you attend the TAFE NSW Wollongbar campus as part of your work/studies?



Value	Percent	Responses
Yes	100.0%	79

Totals: 79

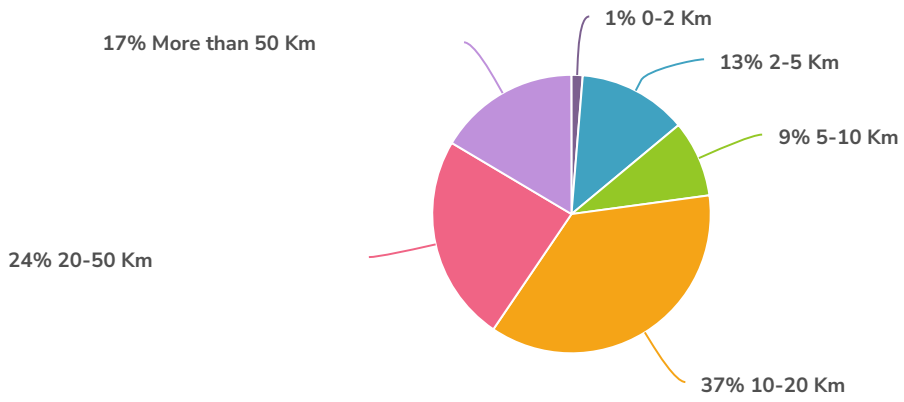
2. Are you staff or student?



Value	Percent	Responses
Staff	100.0%	79

Totals: 79

3. How far do you normally travel from your home to the TAFE NSW Wollongbar campus?



Value	Percent	Responses
0-2 Km	1.3%	1
2-5 Km	12.7%	10
5-10 Km	8.9%	7
10-20 Km	36.7%	29
20-50 Km	24.1%	19
More than 50 Km	16.5%	13

Totals: 79

4. Which is your nearest town centre?

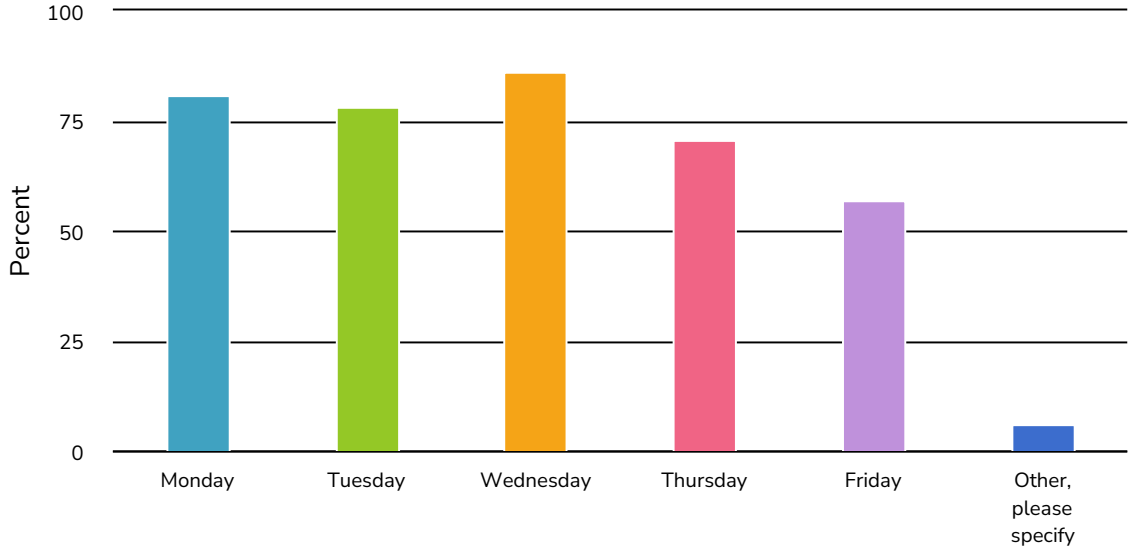
ResponseID	Response
7	Goonellabah
8	Lismore
9	Byron Bay
10	Ballina
11	Lismore
12	Lismore
13	Ballina
14	Lismore
15	Maclean
17	Alstonville
18	ewingsdale
19	Evans Head
20	Alstonville
21	ILUKA
22	Ballina
23	pottsville
24	Ballina
25	Lismore
26	lismore
28	Ballina
29	Alstonville
31	Goonellabah
32	Jimboomba

ResponseID	Response
33	Maclean
34	billinudgel
35	Murwillumbah
36	Lismore
37	Whiporie
38	Wollongbar, NSW 2477
39	Lismore
40	Goonellabah
43	Wollongbar
44	Alstonville
45	Lismore
48	Wollongbar
49	Wollongbar
50	lismore
53	Knockrow
55	Wollongbar
60	Lennox Head
61	Goonellabah
63	Ballina
143	Lismore
223	Iluka
246	Ballina
258	Ballina
259	Duranbah

ResponseID	Response
260	Lismore
261	Alstonville
262	2477 WOLLONGBAR, NSW
263	Alstonville
265	Dunoon
266	Alstonville
267	Alstonville
268	Alstonville
269	Crabbes Creek
271	lennox head
276	Ballina
277	Lismore
280	WOLLONGBAR - NSW
285	Casino
286	Alstonville
287	Ballina
288	Lismore
289	Lismore
290	Ocean Shores
291	Goonellabah
292	Alstonville
294	wollongbar
295	WOLLONGBAR - NSW
296	Lismore

ResponseID	Response
297	Coffs Harbour
298	kingcliff
299	Alstonville
300	Alstonville
301	Wollongbar
302	Ballina
305	lennox head
362	Goonellabah

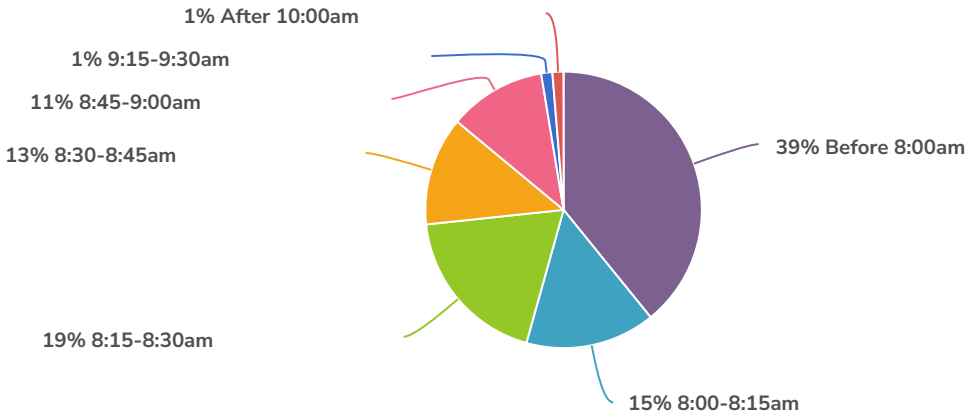
5. Which days do you normally attend the TAFE NSW Wollongbar campus (tick all that apply)



Value	Percent	Responses
Monday	81.0%	64
Tuesday	78.5%	62
Wednesday	86.1%	68
Thursday	70.9%	56
Friday	57.0%	45
Other, please specify	6.3%	5

Other, please specify	Count
It varies from term to term and week to week	1
Kingscliff on Tuesday	1
nights also	1
other days as needed	1
weekednds also for delivery as needed - approx 5 weekends per year	1
Totals	5

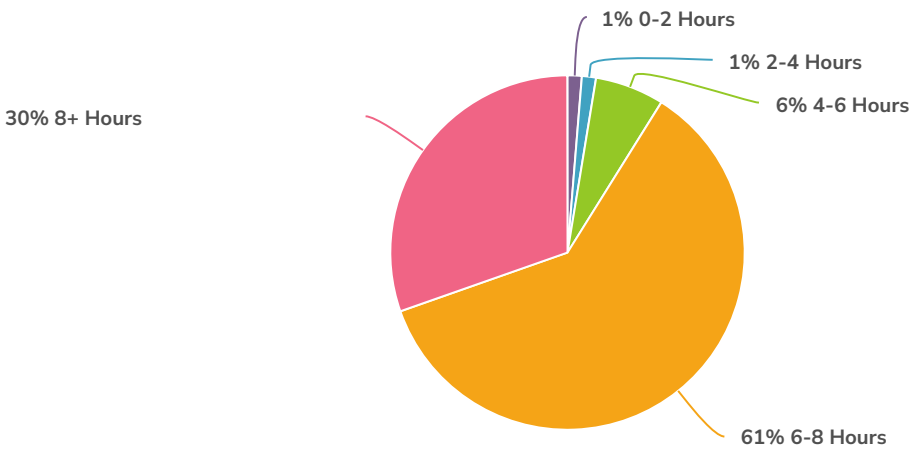
6. What time do you arrive at the campus on a typical day?



Value	Percent	Responses
Before 8:00am	39.2%	31
8:00-8:15am	15.2%	12
8:15-8:30am	19.0%	15
8:30-8:45am	12.7%	10
8:45-9:00am	11.4%	9
9:15-9:30am	1.3%	1
After 10:00am	1.3%	1

Totals: 79

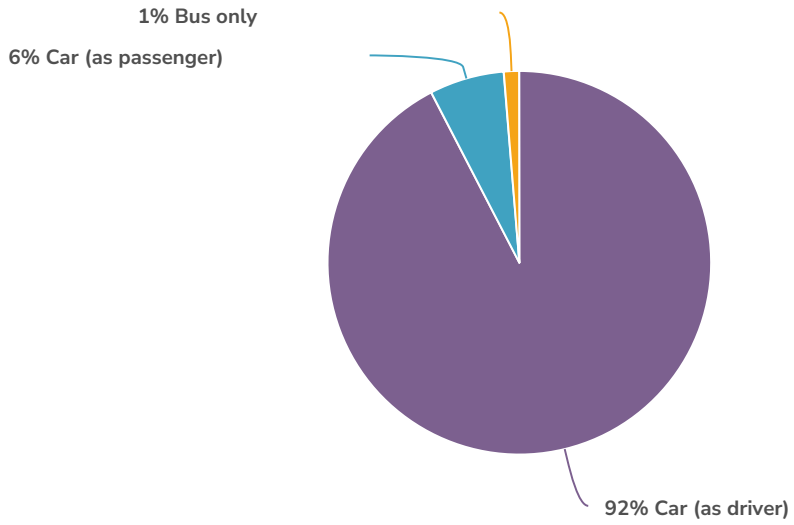
7. How long do you stay on campus during a typical day?



Value	Percent	Responses
0-2 Hours	1.3%	1
2-4 Hours	1.3%	1
4-6 Hours	6.3%	5
6-8 Hours	60.8%	48
8+ Hours	30.4%	24

Totals: 79

8. How do you travel TO the campus on a typical day?



Value	Percent	Responses
Car (as driver)	92.4%	73
Car (as passenger)	6.3%	5
Bus only	1.3%	1

Totals: 79

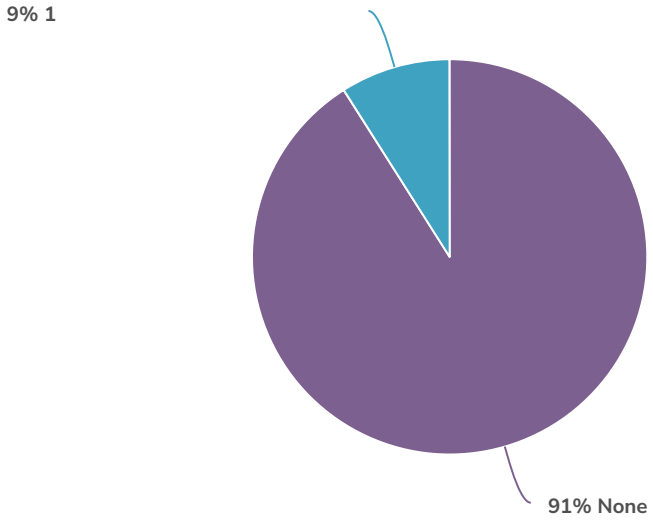
Bus only	Count
woombah to lismore	1
Totals	1

Other	Count
Totals	0

9. How many other TAFE NSW Wollongbar students travel with you?

No data to display

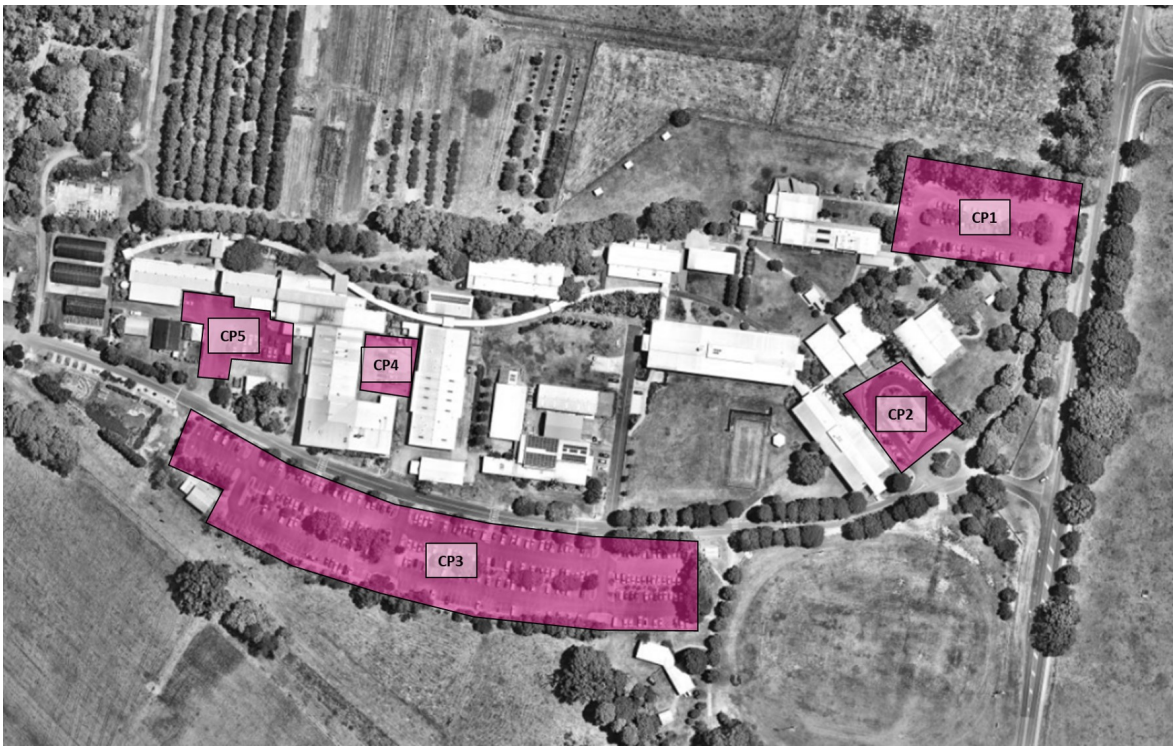
10. How many other TAFE NSW Wollongbar staff travel with you?

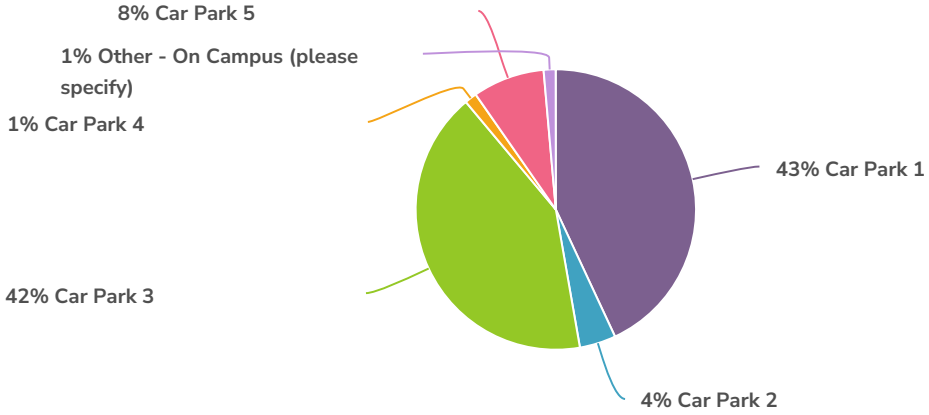


Value	Percent	Responses
None	91.0%	71
1	9.0%	7

Totals: 78

11. Where do you usually park?





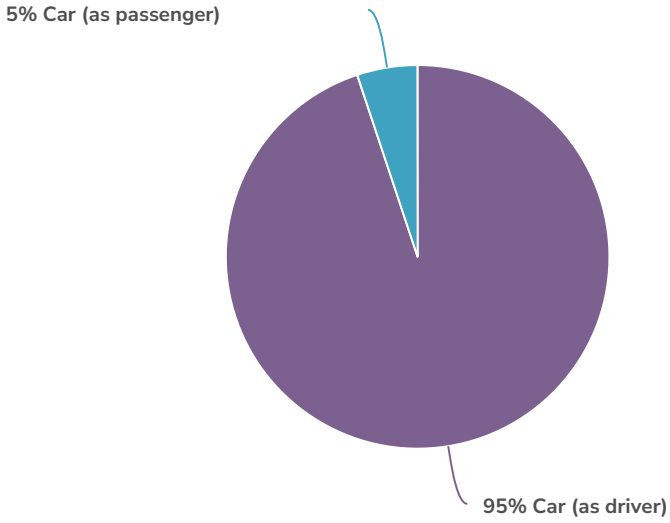
Value	Percent	Responses
Car Park 1	43.1%	31
Car Park 2	4.2%	3
Car Park 3	41.7%	30
Car Park 4	1.4%	1
Car Park 5	8.3%	6
Other - On Campus (please specify)	1.4%	1

Totals: 72

Other - On Campus (please specify)	Count
Z block	1
Totals	1

Other - Off Campus (please specify)	Count
Totals	0

12. How do you travel FROM the campus on a typical day?



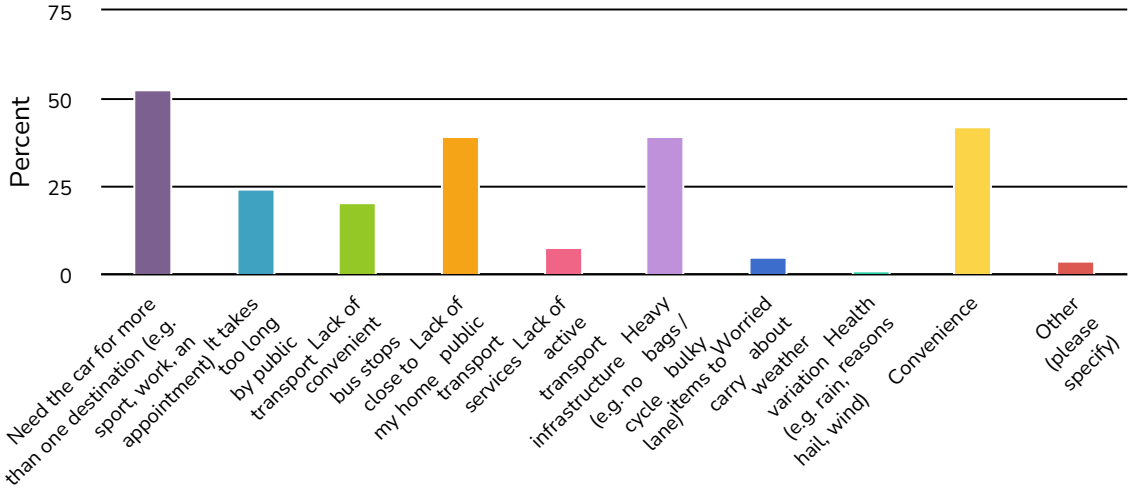
Value	Percent	Responses
Car (as driver)	94.9%	74
Car (as passenger)	5.1%	4

Totals: 78

Bus only	Count
Totals	0

Other	Count
Totals	0

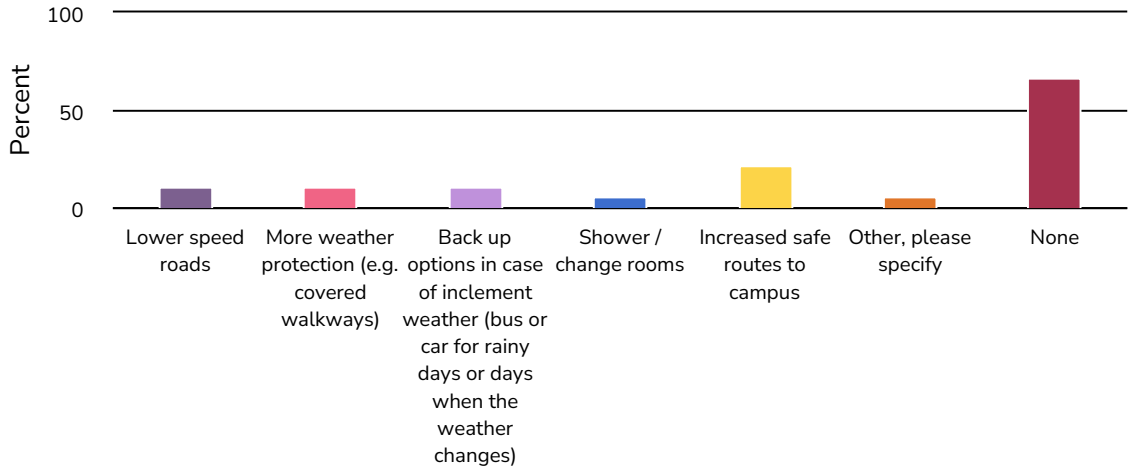
13. Why is car your preferred method of transport to / from school? (Please tick up to 3 options that apply)



Value	Percent	Responses
Need the car for more than one destination (e.g. sport, work, an appointment)	52.6%	41
It takes too long by public transport	24.4%	19
Lack of convenient bus stops close to my home	20.5%	16
Lack of public transport services	39.7%	31
Lack of active transport infrastructure (e.g. no cycle lane)	7.7%	6
Heavy bags / bulky items to carry	39.7%	31
Worried about weather variation (e.g. rain, hail, wind)	5.1%	4
Health reasons	1.3%	1
Convenience	42.3%	33
Other (please specify)	3.8%	3

Other (please specify)	Count
I also do nights finishing at 8.30 to 10	1
I own a vehicle and wish to use it	1
early start	1
Totals	3

14. Which measures would encourage you to walk or cycle? (tick up to 3 options that apply)



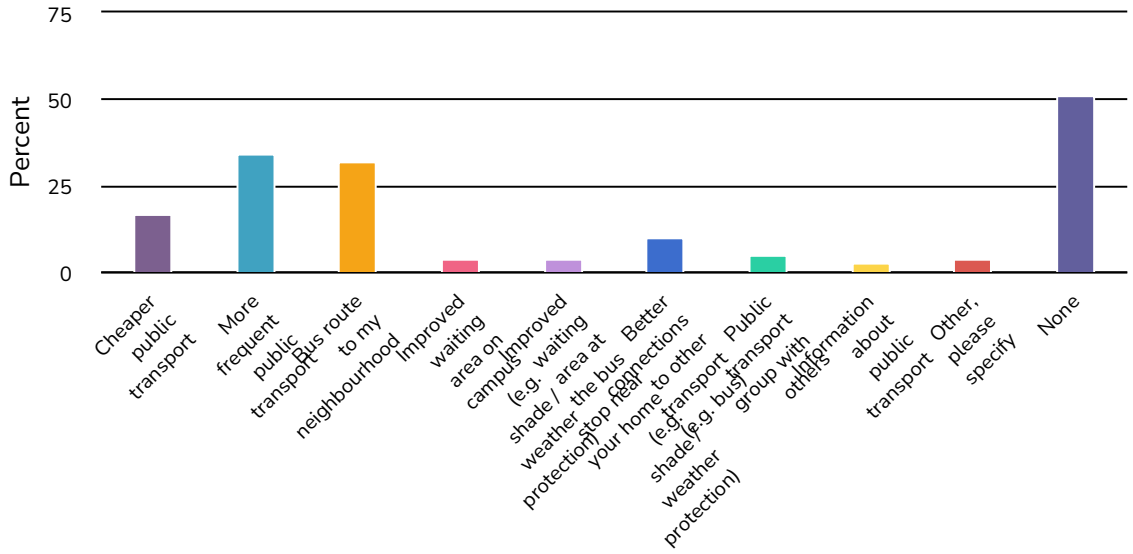
Value	Percent	Responses
Lower speed roads	11.1%	2
More weather protection (e.g. covered walkways)	11.1%	2
Back up options in case of inclement weather (bus or car for rainy days or days when the weather changes)	11.1%	2
Shower / change rooms	5.6%	1
Increased safe routes to campus	22.2%	4
Other, please specify	5.6%	1
None	66.7%	12

Other, please specify	Count
in would not be viable	1
Totals	1

15. As you walk / cycle, what measures would you like to see more? (tick up to 3 options that apply)

Other, please specify	Count
Totals	0

16. Which measures would encourage you to use public transport? (tick up to 3 options that apply)



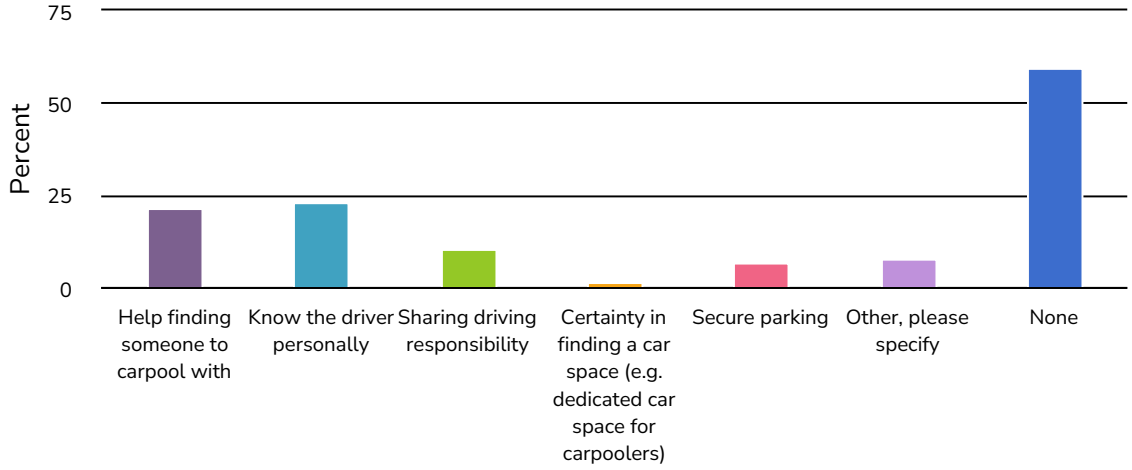
Value	Percent	Responses
Cheaper public transport	16.7%	13
More frequent public transport	34.6%	27
Bus route to my neighbourhood	32.1%	25
Improved waiting area on campus (e.g. shade / weather protection)	3.8%	3
Improved waiting area at the bus stop near your home (e.g. shade / weather protection)	3.8%	3
Better connections to other transport (e.g. bus)	10.3%	8
Public transport group with others	5.1%	4
Information about public transport	2.6%	2
Other, please specify	3.8%	3
None	51.3%	40

Other, please specify	Count
I live remotely, no transport is availble	1
If I wasn't so busy as a HT and didn't have to carry heavy loads and have such a tight schedule, public transport might be an option - if there was any from near my house.	1
no car available	1
Totals	3

17. As you use public transport, what would you like to see more? (tick up to 3 options that apply)

Other, please specify	Count
Totals	0

18. Which measures would encourage you to carpool? (tick up to 3 options that apply)



Value	Percent	Responses
Help finding someone to carpool with	21.6%	16
Know the driver personally	23.0%	17
Sharing driving responsibility	10.8%	8
Certainty in finding a car space (e.g. dedicated car space for carpoolers)	1.4%	1
Secure parking	6.8%	5
Other, please specify	8.1%	6
None	59.5%	44

Other, please specify	Count
Cant find anyone as we start at different times and leave at different times	1
I car pool whenever anyone I am aware of is going to the same place. But it is rare that my schedule matches anyone else's.	1
Only if the person works the same hours as me and was flexible if I need to go home unexpectedly as I am a carer for an elderly person.	1
Someone who start work earlyr	1
Undercover ,secure parking	1
coming and going when I need to	1
Totals	6

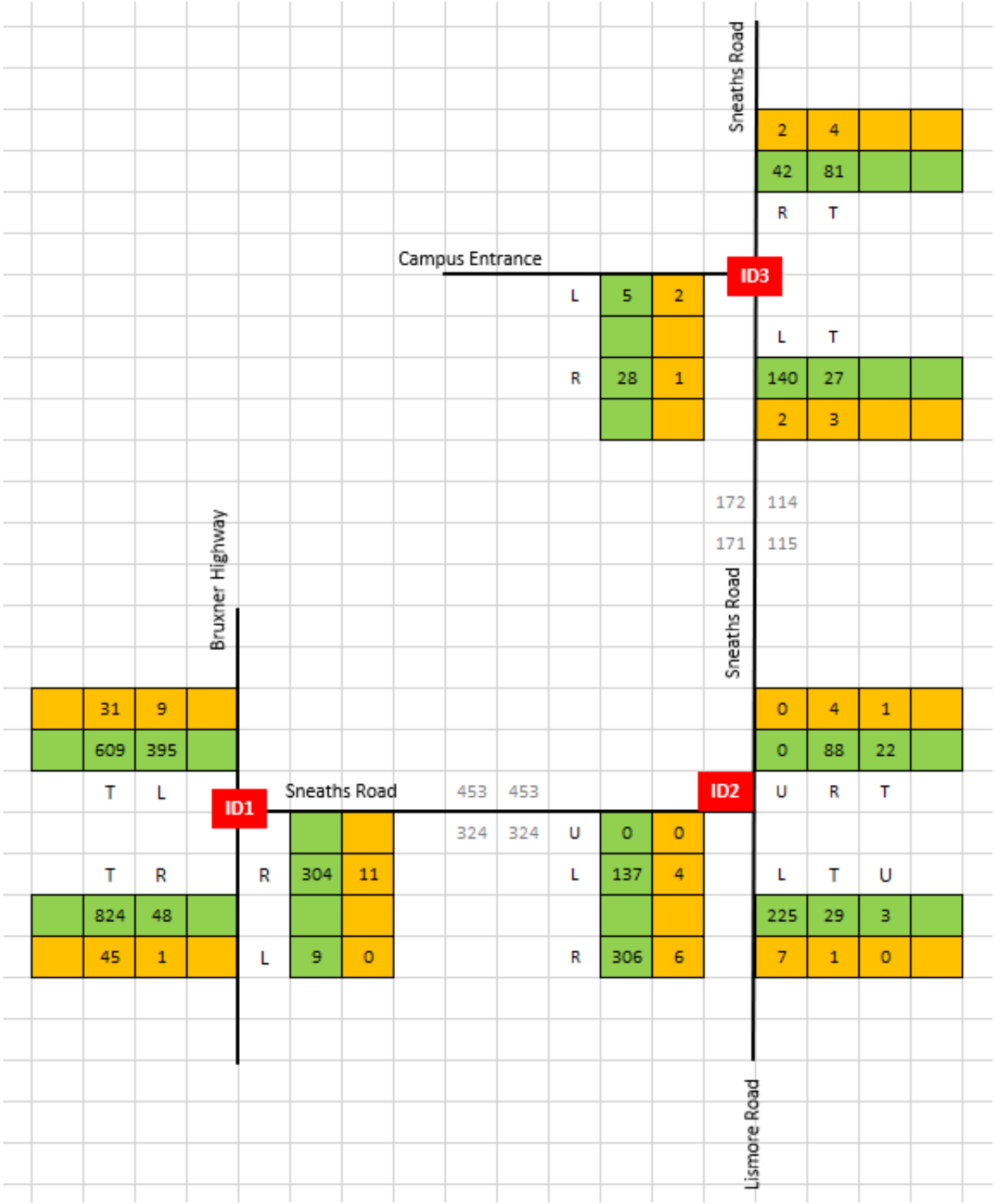
19. Do you have any other transport feedback for our team?

ResponseID	Response
11	TVET students struggle at the begining of their courses as they do not have their TAFE cards to allow them to have free transport. This is a result of how long it takes to process their enrolments
15	I live 98kms away and its hard to find someone to share with. As their start & finish times are different.
18	I work at multiple locations at varying times . Need to use own car
22	you have a parking lot listed between e and h blocks, this is not a parking lot. It is used for Vehicle storage
28	Public transport does not provide the flexibility I need for my work- time shared over two campuses.
36	Shaded car spaces with solar panels would be great. Always get soaking wet walking from car park to actual buildings and classrooms.
45	as a HT , I do a lot of meetings while driving too and from work , so having another staff member with me is not possible at times due to privacy . I also look after Casino, Lismore and Ballina T&H areas of study so i need a car to get too and from each centre.
55	Having young children, I need to drive to work to be able to leave at anytime if they fall ill.
63	There is not enough parking available at Wollongbar Campus on busy days particularly for Staff. Parking is not monitored and cars park in drop off zones.
258	Improved bus services for those that require it.
260	We have prospective and current students who travel from inland villages (eg Nimbin, Kyogle) and the coast (Evans Head, Ballina, Bangalow). Shuttle buses would make a difference for these students, for example, a shuttle from Lismore and a shuttle from Ballina.
262	No
265	Public transport is rarely an option with such a dispersed population. To get to Wollongbar TAFE from many places in our region requires catching at least two busses and is very costly for many students. If we are to increase buildings on Wollongbar campus after the 'All of Region Business Case' we will most certainly need to increase car parking spaces also. As Wollongbar has been used for housing emergency services in times of disaster like the 2022 floods, we need enough car parking space to allow for this to happen without it shutting down the operations of the campus. Even with greater public transport in this region, we will still need an increase in the car parking space on this campus in years to come.

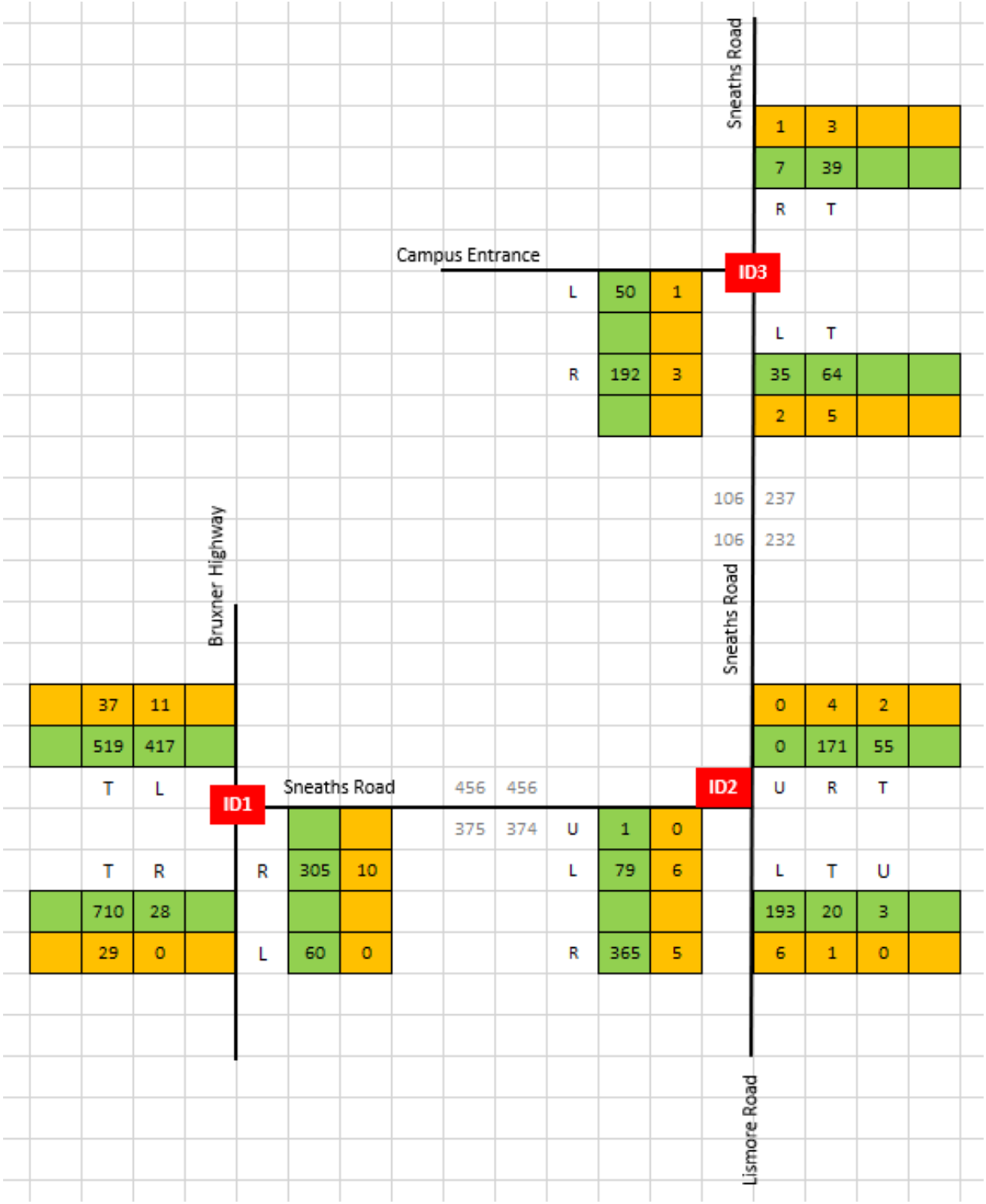
ResponseID	Response
267	I think the bus stop needs to be placed outside the campus (across the road from the entrance) as that can cause traffic jams throughout the day. If more buildings and parks are going to be built i recommend a second entrance to be built possibly on Sneaths road near carpark 1
271	Please remove or remediate the speed humps. Fine incorrectly parked vehicles!
280	Undercover parking would be ideal
285	There is no public transport from Casino to Wollongbar that arrives at 7am which is my normal start time
290	It is not really an option for me to come to work any other way but by car. Also hard for me to carpool with my responsibility that I have outside of work hours
295	Undercover Parking would be Ideal
296	Thank you
299	no
362	I have to use my car as I teach plant units and collect much of my material off campus at a broad range of locations

Appendix 2. Current and Future Traffic Volumes and Distribution

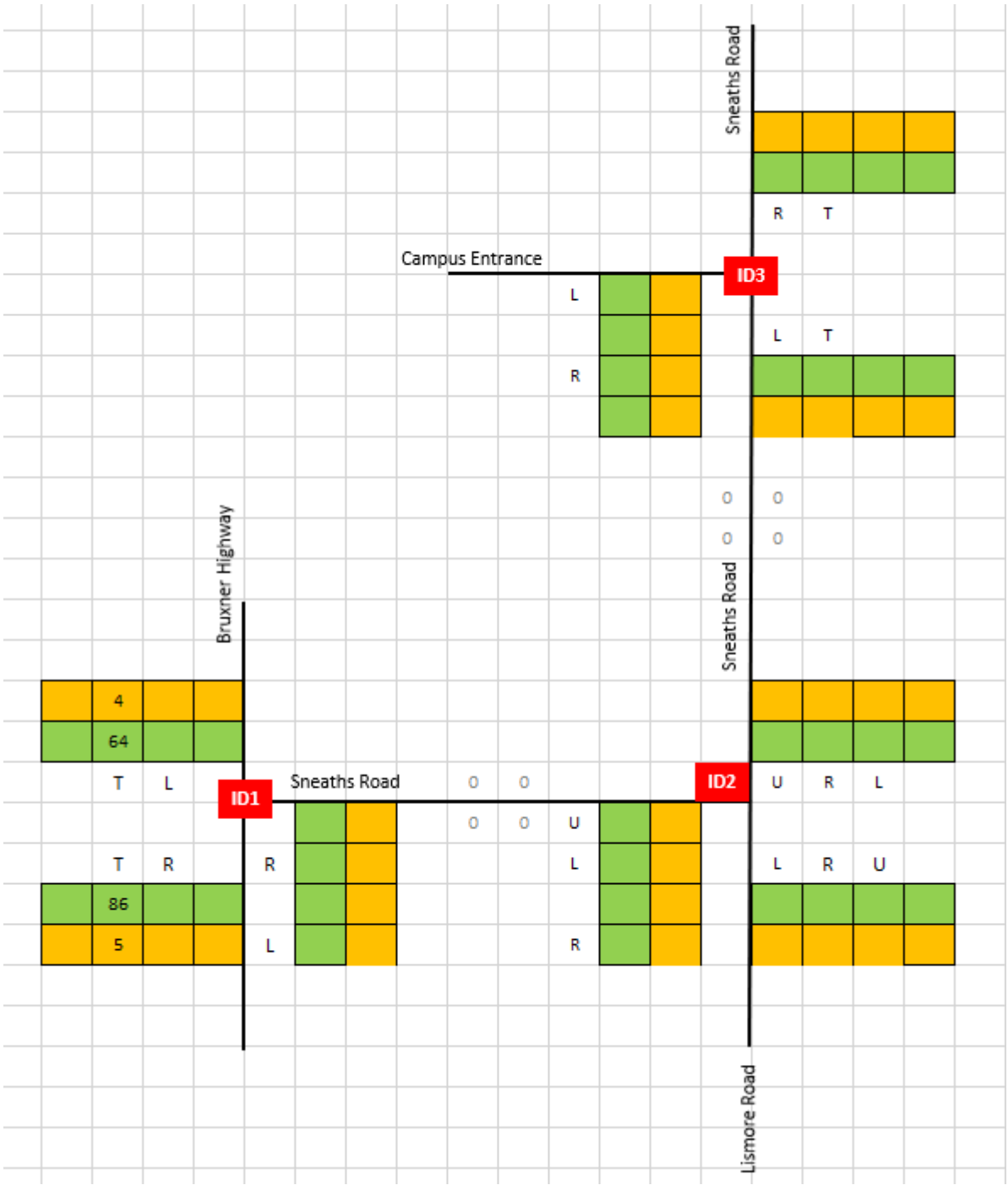
Existing AM Traffic Volumes



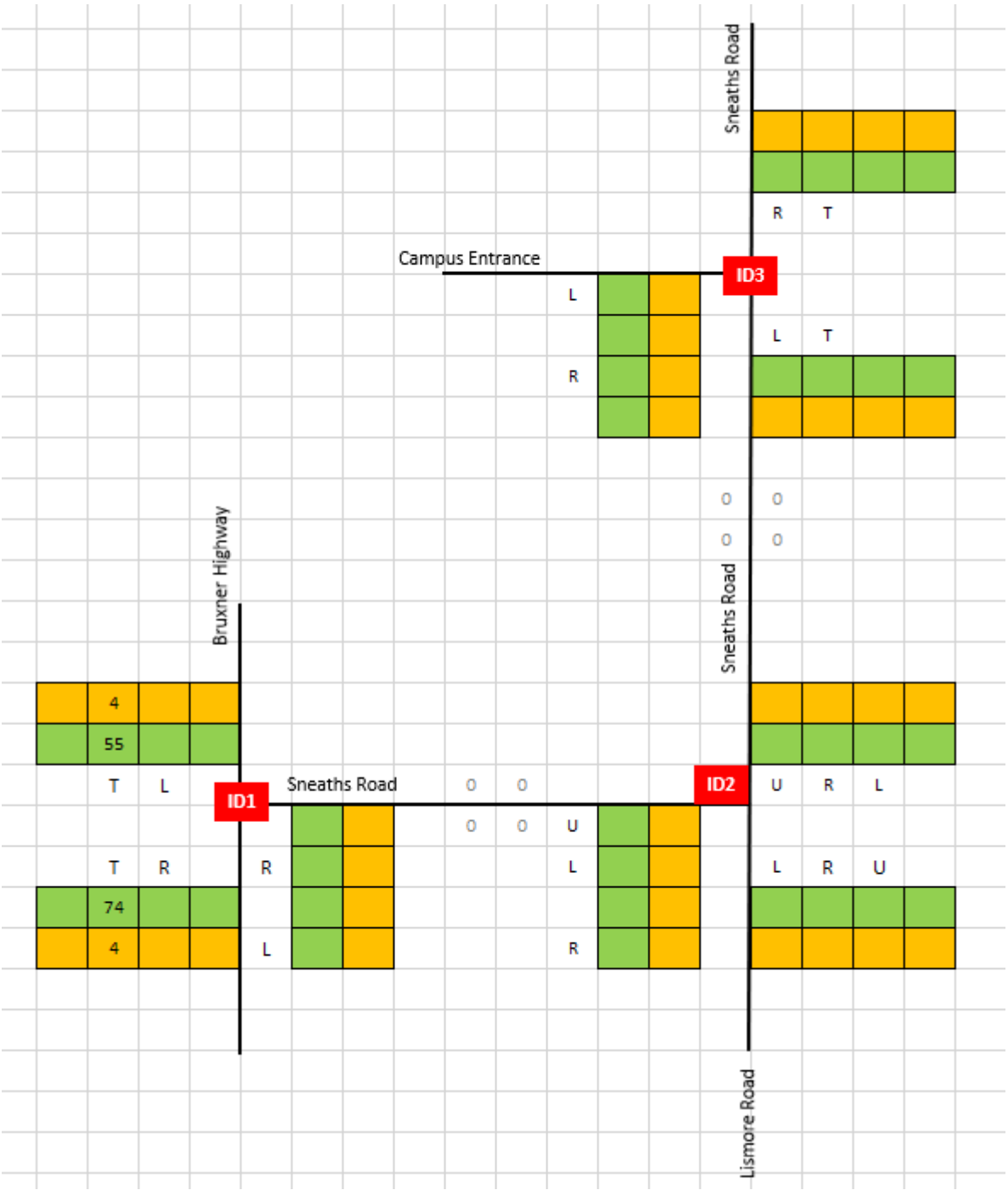
Existing PM Traffic Volumes



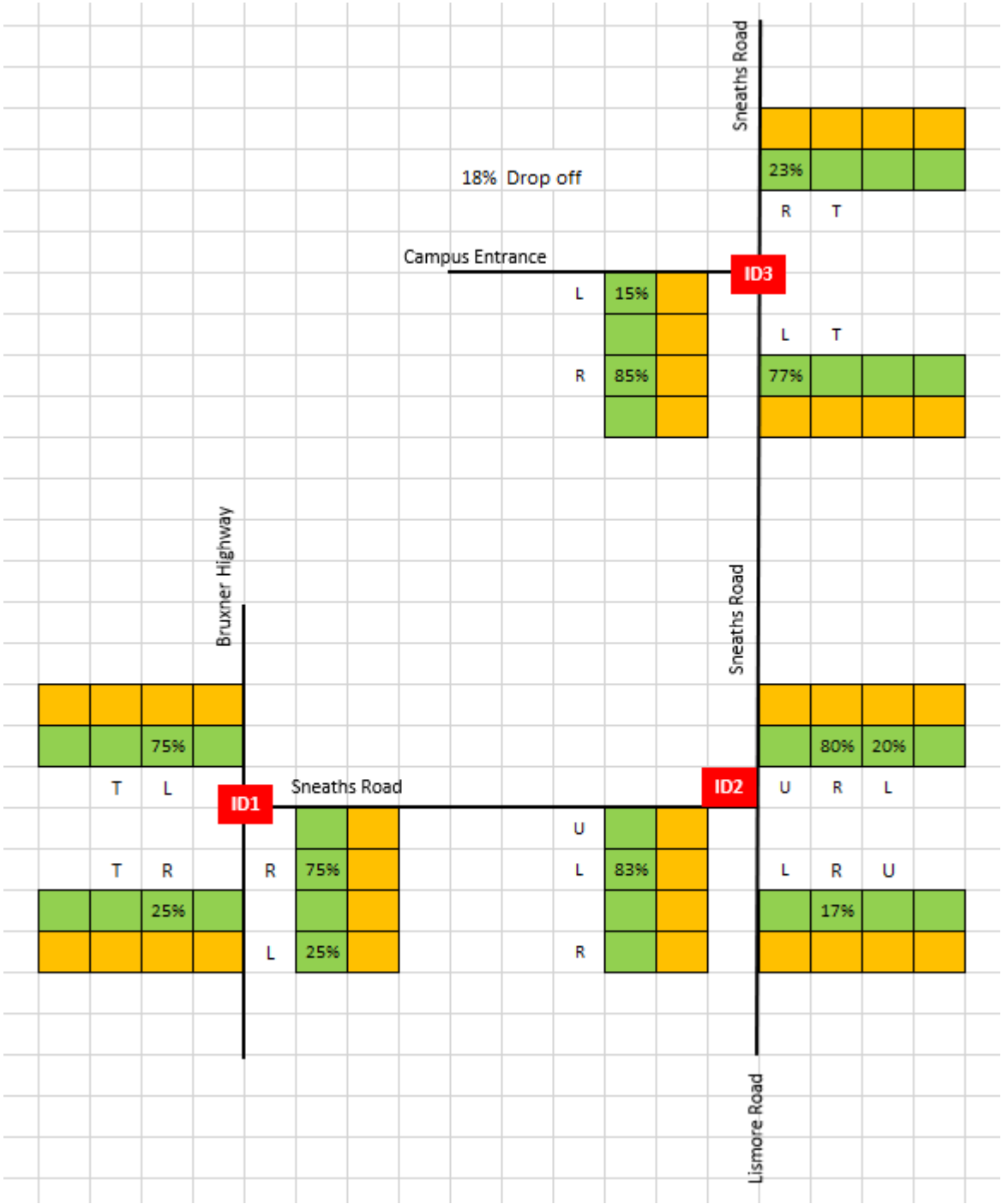
Background Growth AM Traffic Volumes



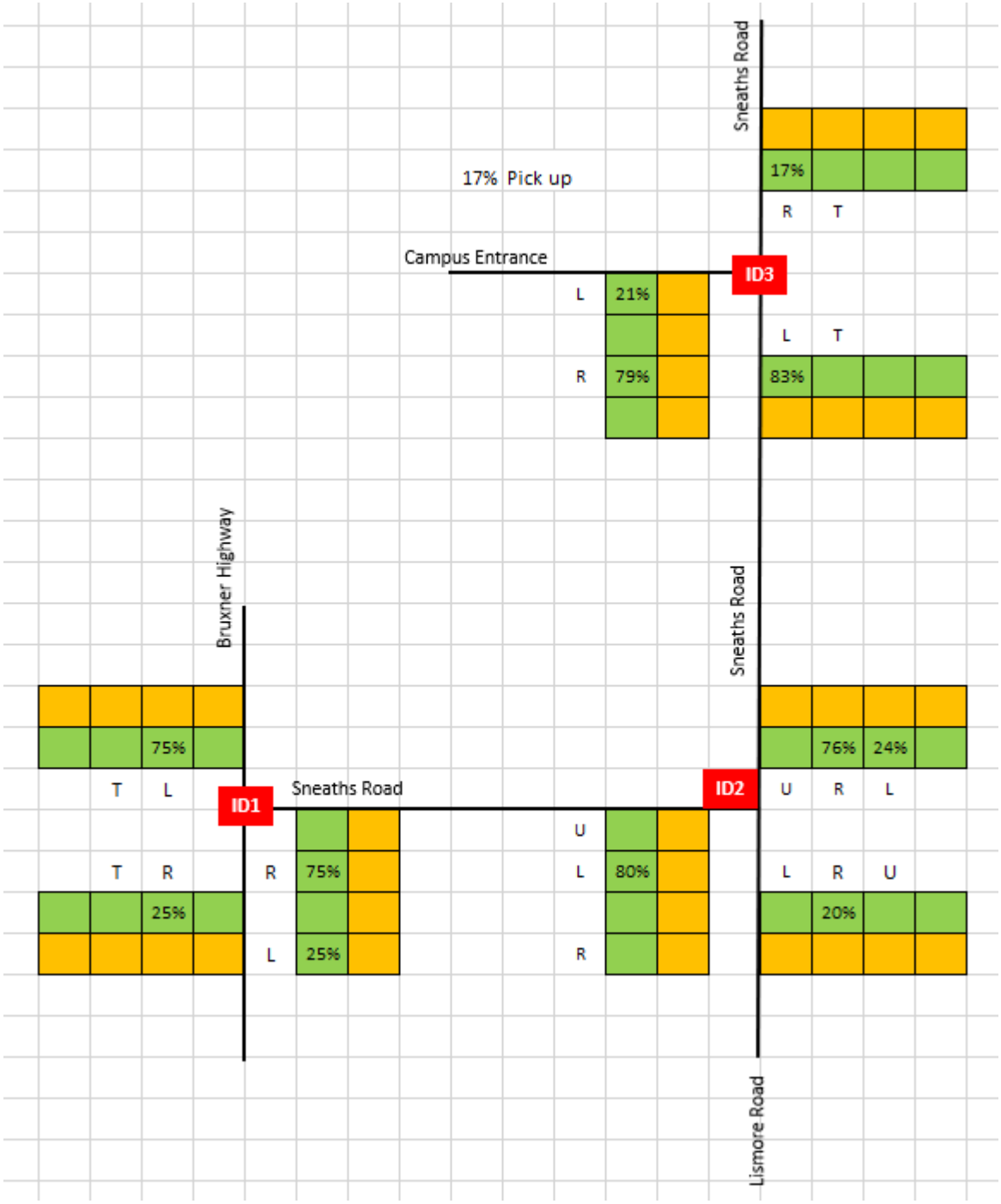
Background Growth PM Traffic Volumes



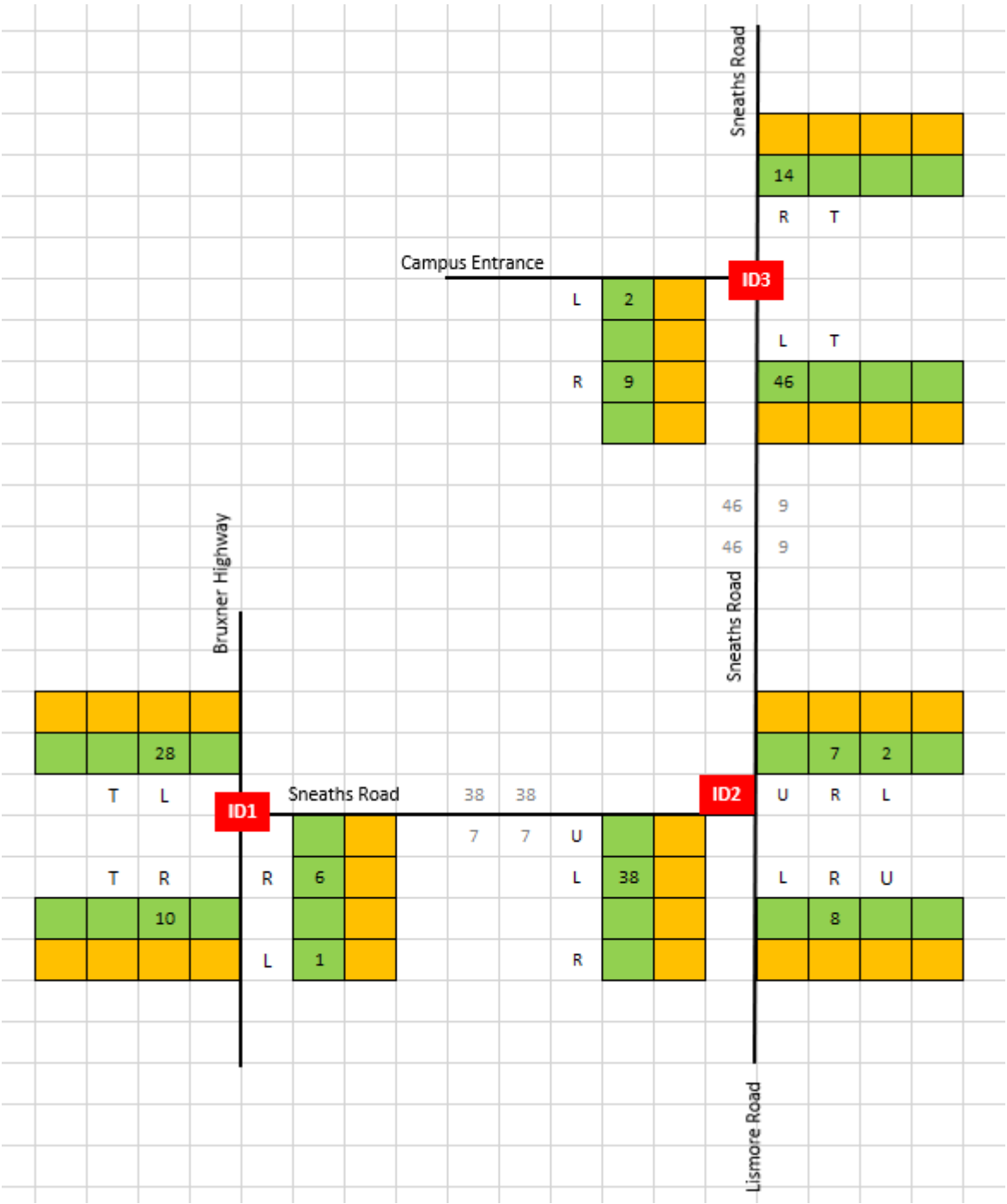
Future AM – Traffic Distribution



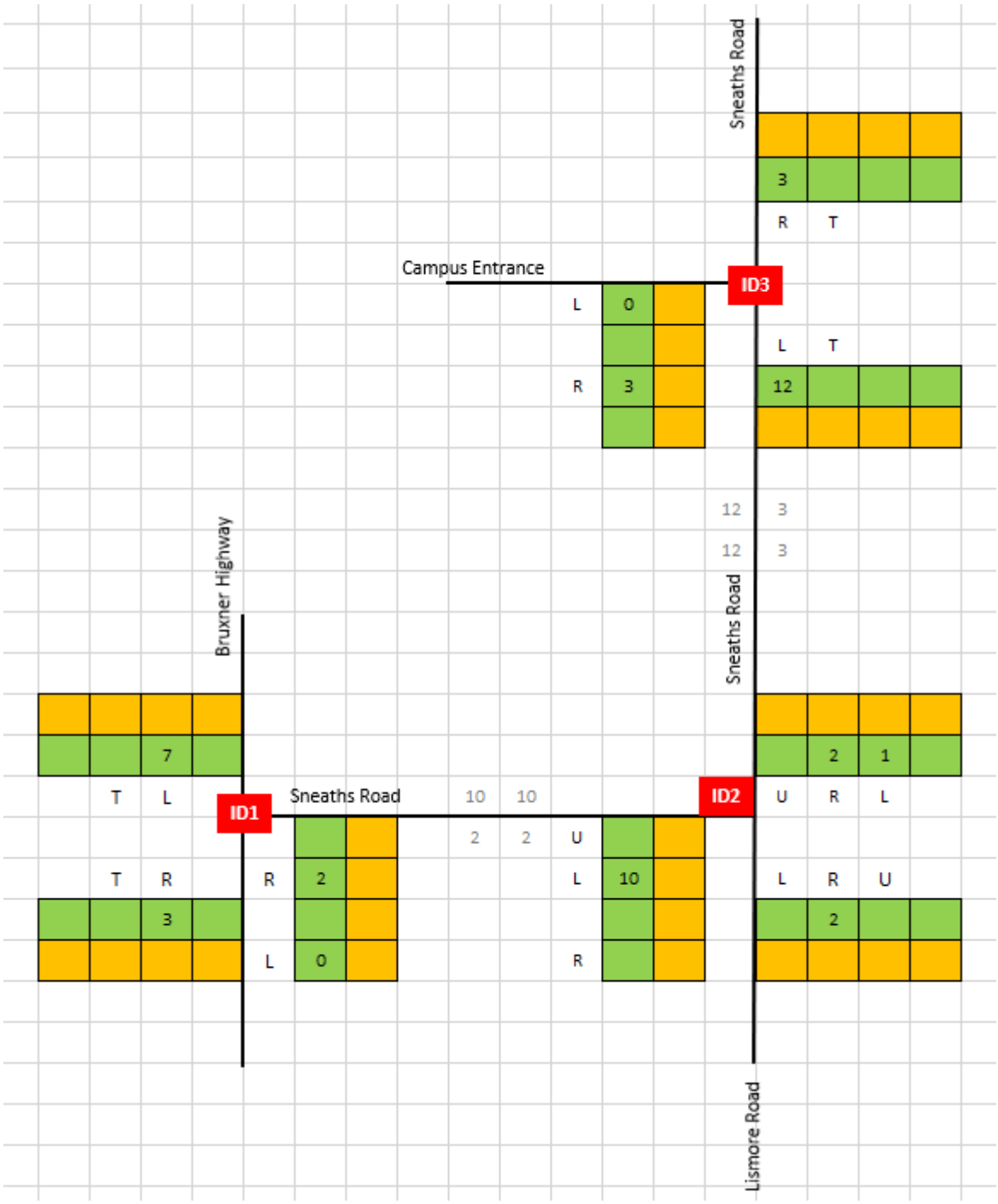
Future PM – Traffic Distribution



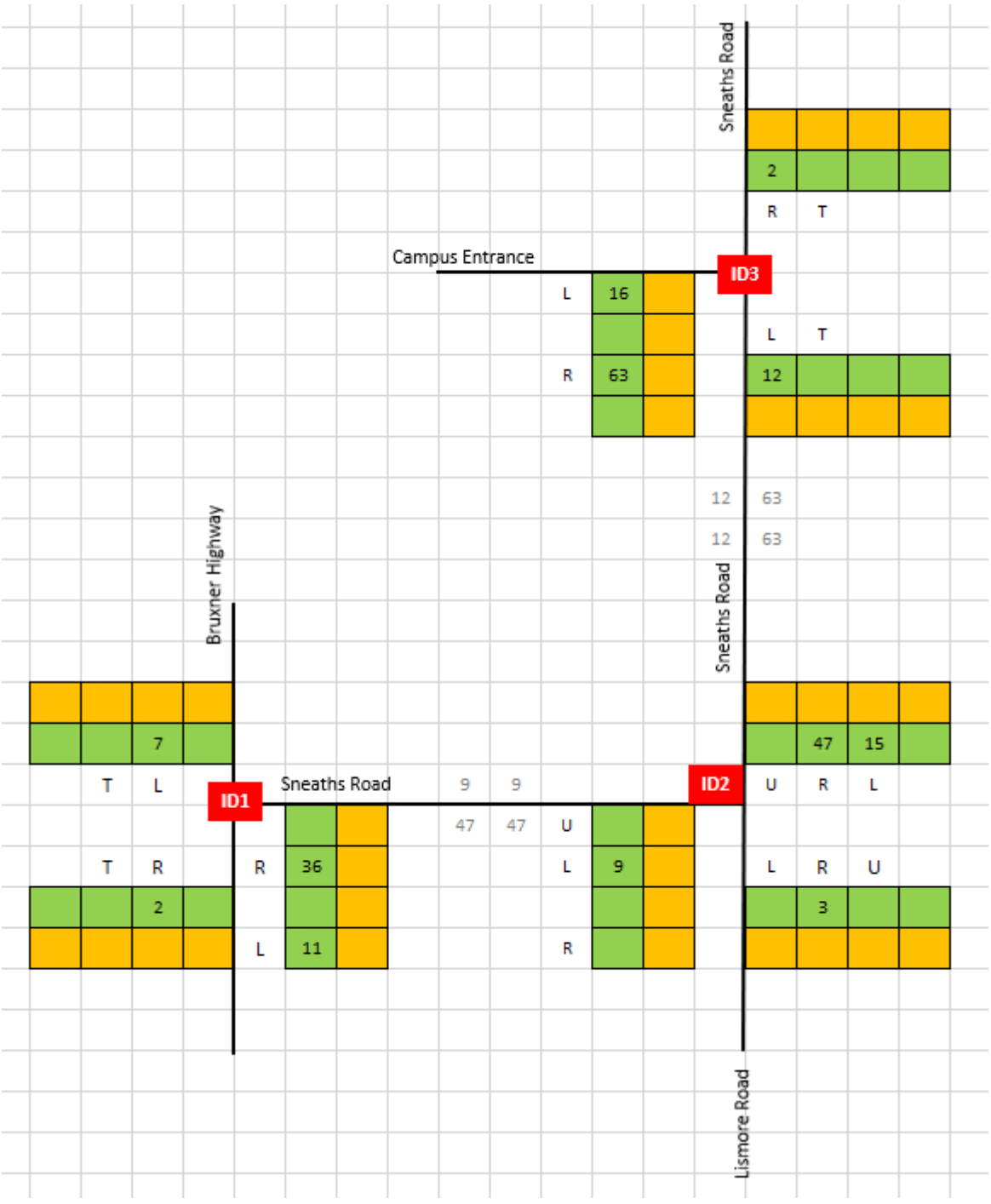
Future AM Traffic Volumes – Additional Students



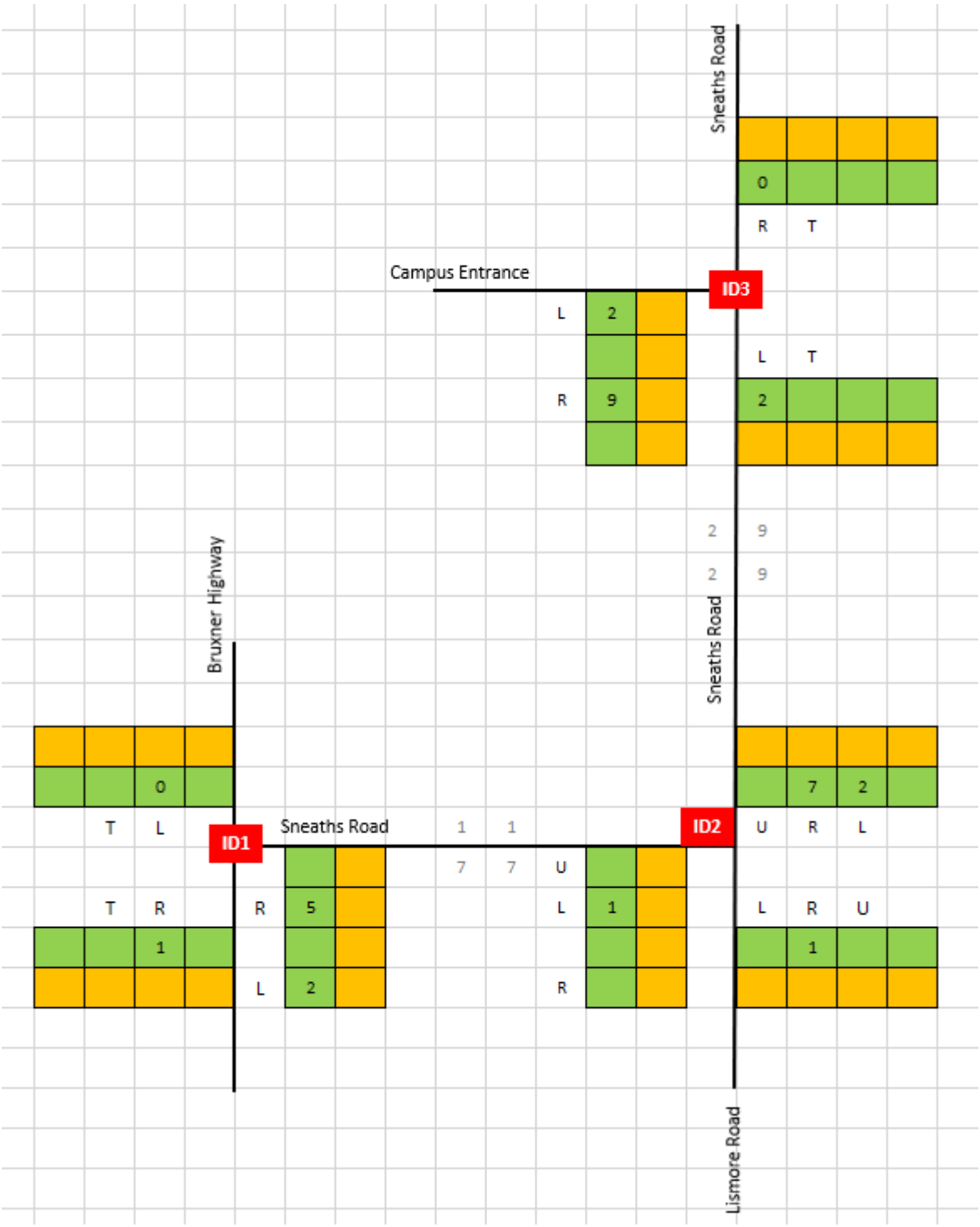
Future AM Traffic Volumes – Additional Staff



Future PM Traffic Volumes – Additional Students



Future PM Traffic Volumes – Additional Staff



Appendix 3. SIDRA Output

MOVEMENT SUMMARY

Site: 101 [1A. 1 Bruxner Hwy / Sneaths Rd - Existing AM (Site Folder: 1. Existing AM)]

Network: N101 [1 Existing AM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 6:00am-10:00am
Peak Hour: 7:30am-8:30am
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Bruxner Hwy (SE)														
22	T1	915	5.2	915	5.2	0.485	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.5
23	R2	52	2.0	52	2.0	0.063	10.1	LOS B	0.2	1.8	0.59	0.79	0.59	55.7
Approach		966	5.0	966	5.0	0.485	0.7	NA	0.2	1.8	0.03	0.04	0.03	78.6
NorthEast: Sneaths Rd (NE)														
24	L2	9	0.0	9	0.0	0.012	7.0	LOS A	0.0	0.3	0.55	0.66	0.55	56.4
26	R2	332	3.5	332	3.5	0.853	30.7	LOS D	8.5	61.2	0.93	1.52	2.84	33.0
Approach		341	3.4	341	3.4	0.853	30.0	LOS D	8.5	61.2	0.92	1.50	2.78	33.4
NorthWest: Bruxner Hwy (NW)														
27	L2	425	2.2	425	2.2	0.244	7.7	LOS A	0.0	0.0	0.00	0.60	0.00	60.7
28	T1	674	4.8	674	4.8	0.346	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.7
Approach		1099	3.8	1099	3.8	0.346	3.0	NA	0.0	0.0	0.00	0.23	0.00	74.0
All Vehicles		2406	4.2	2406	4.2	0.853	5.9	NA	8.5	61.2	0.14	0.34	0.41	68.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [1B. 2 Sneaths Rd / Lismore Rd - Existing AM (Site Folder: 1. Existing AM)]

Network: N101 [1 Existing AM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 6:00am-10:00am
Peak Hour: 7:30am-8:30am
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Lismore Rd (SE)														
21	L2	244	3.0	244	3.0	0.108	4.8	LOS A	0.6	4.6	0.28	0.51	0.28	50.4
23a	R1	32	3.3	32	3.3	0.108	8.1	LOS A	0.6	4.0	0.29	0.53	0.29	49.7
23u	U	3	0.0	3	0.0	0.108	11.0	LOS B	0.6	4.0	0.29	0.53	0.29	55.3
Approach		279	3.0	279	3.0	0.108	5.3	LOS A	0.6	4.6	0.28	0.51	0.28	50.5
North: Sneaths Rd (N)														
7a	L1	24	4.3	24	4.3	0.141	6.3	LOS A	0.8	5.4	0.55	0.66	0.55	52.2
9a	R1	97	4.3	97	4.3	0.141	9.9	LOS A	0.8	5.4	0.55	0.66	0.55	46.5
9u	U	1	0.0	1	0.0	0.141	12.7	LOS B	0.8	5.4	0.55	0.66	0.55	46.5
Approach		122	4.3	122	4.3	0.141	9.2	LOS A	0.8	5.4	0.55	0.66	0.55	48.2
SouthWest: Sneaths Rd (SW)														
30a	L1	148	2.8	148	2.8	0.317	2.7	LOS A	1.7	12.3	0.14	0.59	0.14	27.7
32	R2	328	1.9	328	1.9	0.317	6.9	LOS A	1.7	12.3	0.14	0.59	0.14	51.5
32u	U	1	0.0	1	0.0	0.317	8.9	LOS A	1.7	12.3	0.14	0.59	0.14	27.7
Approach		478	2.2	478	2.2	0.317	5.6	LOS A	1.7	12.3	0.14	0.59	0.14	48.9
All Vehicles		879	2.8	879	2.8	0.317	6.0	LOS A	1.7	12.3	0.24	0.57	0.24	49.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 103 [1C. 3 Sneaths Rd / TAFE Entry - Existing AM (Site Folder: 1. Existing AM)]

Network: N101 [1 Existing AM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 6:00am-10:00am
Peak Hour: 7:30am-8:30am
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Sneaths Rd (S)														
1	L2	149	1.4	149	1.4	0.084	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	48.8
2	T1	32	10.0	32	10.0	0.018	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		181	2.9	181	2.9	0.084	4.6	NA	0.0	0.0	0.00	0.48	0.00	50.8
North: Sneaths Rd (N)														
8	T1	89	4.7	89	4.7	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	46	4.5	46	4.5	0.039	6.2	LOS A	0.2	1.1	0.29	0.58	0.29	37.4
Approach		136	4.7	136	4.7	0.048	2.1	NA	0.2	1.1	0.10	0.20	0.10	48.8
West: TAFE Entry (W)														
10	L2	7	28.6	7	28.6	0.051	7.1	LOS A	0.2	1.4	0.22	0.93	0.22	31.0
12	R2	31	3.4	31	3.4	0.051	8.2	LOS A	0.2	1.4	0.22	0.93	0.22	15.0
Approach		38	8.3	38	8.3	0.051	8.0	LOS A	0.2	1.4	0.22	0.93	0.22	21.0
All Vehicles		355	4.2	355	4.2	0.084	4.0	NA	0.2	1.4	0.06	0.42	0.06	48.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
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 [2A. 1 Bruxner Hwy / Sneaths Rd - Existing PM (Site Folder: 2. Existing PM)]

Network: N101 [2 Existing PM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 2:00pm-6:00pm
Peak Hour: 3:30pm-4:30pm
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Bruxner Hwy (SE)														
22	T1	778	3.9	778	3.9	0.409	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.7
23	R2	29	0.0	29	0.0	0.031	9.2	LOS A	0.1	0.9	0.54	0.72	0.54	57.1
Approach		807	3.8	807	3.8	0.409	0.4	NA	0.1	0.9	0.02	0.03	0.02	79.1
NorthEast: Sneaths Rd (NE)														
24	L2	63	0.0	63	0.0	0.072	6.5	LOS A	0.3	1.9	0.53	0.71	0.53	57.1
26	R2	332	3.2	332	3.2	0.707	18.4	LOS C	5.5	39.6	0.84	1.22	1.78	41.3
Approach		395	2.7	395	2.7	0.707	16.5	LOS C	5.5	39.6	0.79	1.13	1.58	43.3
NorthWest: Bruxner Hwy (NW)														
27	L2	451	2.6	451	2.6	0.259	7.7	LOS A	0.0	0.0	0.00	0.60	0.00	60.7
28	T1	585	6.7	585	6.7	0.304	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
Approach		1036	4.9	1036	4.9	0.304	3.4	NA	0.0	0.0	0.00	0.26	0.00	73.2
All Vehicles		2238	4.1	2238	4.1	0.707	4.6	NA	5.5	39.6	0.15	0.33	0.29	69.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [2B. 2 Sneaths Rd / Lismore Rd - Existing PM (Site Folder: 2. Existing PM)]

Network: N101 [2 Existing PM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 2:00Pm-6:00Pm
Peak Hour: 3:30Pm-4:30Pm
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Lismore Rd (SE)														
21	L2	209	3.0	209	3.0	0.094	5.2	LOS A	0.6	4.1	0.39	0.54	0.39	49.9
23a	R1	22	4.8	22	4.8	0.094	8.5	LOS A	0.5	3.9	0.40	0.56	0.40	49.3
23u	U	3	0.0	3	0.0	0.094	11.4	LOS B	0.5	3.9	0.40	0.56	0.40	55.0
Approach		235	3.1	235	3.1	0.094	5.6	LOS A	0.6	4.1	0.39	0.54	0.39	49.9
North: Sneaths Rd (N)														
7a	L1	60	3.5	60	3.5	0.262	7.1	LOS A	1.7	12.3	0.64	0.72	0.64	51.8
9a	R1	184	2.3	184	2.3	0.262	10.6	LOS B	1.7	12.3	0.64	0.72	0.64	45.9
9u	U	1	0.0	1	0.0	0.262	13.5	LOS B	1.7	12.3	0.64	0.72	0.64	45.9
Approach		245	2.6	245	2.6	0.262	9.8	LOS A	1.7	12.3	0.64	0.72	0.64	48.0
SouthWest: Sneaths Rd (SW)														
30a	L1	89	7.1	89	7.1	0.312	2.6	LOS A	1.8	12.6	0.12	0.61	0.12	27.0
32	R2	389	1.4	389	1.4	0.312	6.9	LOS A	1.8	12.6	0.12	0.61	0.12	51.0
32u	U	1	0.0	1	0.0	0.312	8.8	LOS A	1.8	12.6	0.12	0.61	0.12	27.0
Approach		480	2.4	480	2.4	0.312	6.1	LOS A	1.8	12.6	0.12	0.61	0.12	49.5
All Vehicles		960	2.6	960	2.6	0.312	6.9	LOS A	1.8	12.6	0.32	0.62	0.32	49.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 103 [2C. 3 Sneaths Rd / TAFE Entry - Existing PM (Site Folder: 2. Existing PM)]

Network: N101 [2 Existing PM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 2:00pm-6:00pm
Peak Hour: 3:30pm-4:30pm
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Sneaths Rd (S)														
1	L2	39	5.4	39	5.4	0.022	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	48.7
2	T1	73	7.2	73	7.2	0.040	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		112	6.6	112	6.6	0.040	2.0	NA	0.0	0.0	0.00	0.20	0.00	56.2
North: Sneaths Rd (N)														
8	T1	44	7.1	44	7.1	0.024	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	8	12.5	8	12.5	0.007	6.0	LOS A	0.0	0.2	0.22	0.55	0.22	37.7
Approach		53	8.0	53	8.0	0.024	1.0	NA	0.0	0.2	0.04	0.09	0.04	54.1
West: TAFE Entry (W)														
10	L2	54	2.0	54	2.0	0.301	6.8	LOS A	1.4	10.2	0.32	0.88	0.32	35.7
12	R2	205	1.5	205	1.5	0.301	7.6	LOS A	1.4	10.2	0.32	0.88	0.32	15.8
Approach		259	1.6	259	1.6	0.301	7.5	LOS A	1.4	10.2	0.32	0.88	0.32	23.1
All Vehicles		423	3.7	423	3.7	0.301	5.2	NA	1.4	10.2	0.20	0.60	0.20	42.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
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 [3A. 1 Bruxner Hwy / Sneaths Rd - Background growth AM (Site Folder: 3. Background Growth AM)]

Network: N101 [3 Background Growth AM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 6:00am-10:00am
Peak Hour: 7:30am-8:30am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Bruxner Hwy (SE)														
22	T1	1011	5.2	1011	5.2	0.536	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	77.0
23	R2	52	2.0	52	2.0	0.071	10.8	LOS B	0.3	1.9	0.61	0.82	0.61	54.6
Approach		1062	5.1	1062	5.1	0.536	0.7	NA	0.3	1.9	0.03	0.04	0.03	76.2
NorthEast: Sneaths Rd (NE)														
24	L2	9	0.0	9	0.0	0.014	7.6	LOS A	0.0	0.3	0.58	0.70	0.58	55.5
26	R2	332	3.5	332	3.5	0.985	66.1	LOS F	15.9	114.3	0.99	2.14	5.08	20.9
Approach		341	3.4	341	3.4	0.985	64.5	LOS F	15.9	114.3	0.98	2.10	4.96	21.2
NorthWest: Bruxner Hwy (NW)														
27	L2	425	2.2	425	2.2	0.244	7.7	LOS A	0.0	0.0	0.00	0.60	0.00	60.7
28	T1	745	4.9	745	4.9	0.383	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	77.2
Approach		1171	4.0	1171	4.0	0.383	2.9	NA	0.0	0.0	0.00	0.22	0.00	72.7
All Vehicles		2574	4.3	2574	4.3	0.985	10.1	NA	15.9	114.3	0.14	0.39	0.67	61.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [3B. 2 Sneaths Rd / Lismore Rd - Background Growth AM (Site Folder: 3. Background Growth AM)]

Network: N101 [3 Background Growth AM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 6:00am-10:00am
Peak Hour: 7:30am-8:30am
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Lismore Rd (SE)														
21	L2	244	3.0	244	3.0	0.128	4.8	LOS A	0.8	5.6	0.29	0.51	0.29	50.5
23a	R1	32	3.3	32	3.3	0.128	8.1	LOS A	0.4	3.2	0.29	0.55	0.29	49.3
23u	U	3	0.0	3	0.0	0.128	11.0	LOS B	0.4	3.2	0.29	0.55	0.29	55.0
Approach		279	3.0	279	3.0	0.128	5.3	LOS A	0.8	5.6	0.29	0.52	0.29	50.4
North: Sneaths Rd (N)														
7a	L1	24	4.3	24	4.3	0.223	6.3	LOS A	0.8	5.4	0.55	0.68	0.55	52.2
9a	R1	97	4.3	97	4.3	0.223	9.9	LOS A	0.8	5.4	0.55	0.68	0.55	46.5
9u	U	1	0.0	1	0.0	0.223	12.7	LOS B	0.8	5.4	0.55	0.68	0.55	46.5
Approach		122	4.3	122	4.3	0.223	9.2	LOS A	0.8	5.4	0.55	0.68	0.55	48.2
SouthWest: Sneaths Rd (SW)														
30a	L1	148	2.8	148	2.8	0.317	2.7	LOS A	1.7	12.3	0.14	0.59	0.14	27.7
32	R2	328	1.9	328	1.9	0.317	6.9	LOS A	1.7	12.3	0.14	0.59	0.14	51.5
32u	U	1	0.0	1	0.0	0.317	8.9	LOS A	1.7	12.3	0.14	0.59	0.14	27.7
Approach		478	2.2	478	2.2	0.317	5.6	LOS A	1.7	12.3	0.14	0.59	0.14	48.9
All Vehicles		879	2.8	879	2.8	0.317	6.0	LOS A	1.7	12.3	0.25	0.58	0.25	49.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 103 [3C. 3 Sneaths Rd / TAFE Entry - Background Growth AM (Site Folder: 3. Background Growth AM)]

Network: N101 [3 Background Growth AM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 6:00am-10:00am
Peak Hour: 7:30am-8:30am
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Sneaths Rd (S)														
1	L2	149	1.4	149	1.4	0.084	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	48.8
2	T1	32	10.0	32	10.0	0.018	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		181	2.9	181	2.9	0.084	4.6	NA	0.0	0.0	0.00	0.48	0.00	50.8
North: Sneaths Rd (N)														
8	T1	89	4.7	89	4.7	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	46	4.5	46	4.5	0.039	6.2	LOS A	0.2	1.1	0.29	0.58	0.29	37.4
Approach		136	4.7	136	4.7	0.048	2.1	NA	0.2	1.1	0.10	0.20	0.10	48.8
West: TAFE Entry (W)														
10	L2	7	28.6	7	28.6	0.051	7.1	LOS A	0.2	1.4	0.22	0.93	0.22	31.0
12	R2	31	3.4	31	3.4	0.051	8.2	LOS A	0.2	1.4	0.22	0.93	0.22	15.0
Approach		38	8.3	38	8.3	0.051	8.0	LOS A	0.2	1.4	0.22	0.93	0.22	21.0
All Vehicles		355	4.2	355	4.2	0.084	4.0	NA	0.2	1.4	0.06	0.42	0.06	48.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
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 [4A. 1 Bruxner Hwy / Sneaths Rd - Background Growth PM (Site Folder: 4. Background Growth PM)]

Network: N101 [4 Background Growth PM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 2:00pm-6:00pm
Peak Hour: 3:30pm-4:30pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Bruxner Hwy (SE)														
22	T1	860	4.0	860	4.0	0.453	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	77.1
23	R2	29	0.0	29	0.0	0.034	9.7	LOS A	0.1	0.9	0.57	0.74	0.57	56.3
Approach		889	3.9	889	3.9	0.453	0.4	NA	0.1	0.9	0.02	0.02	0.02	76.6
NorthEast: Sneaths Rd (NE)														
24	L2	63	0.0	63	0.0	0.079	7.0	LOS A	0.3	2.0	0.55	0.74	0.55	56.3
26	R2	332	3.2	332	3.2	0.794	24.3	LOS C	7.0	50.0	0.90	1.37	2.31	36.9
Approach		395	2.7	395	2.7	0.794	21.5	LOS C	7.0	50.0	0.84	1.27	2.03	39.0
NorthWest: Bruxner Hwy (NW)														
27	L2	451	2.6	451	2.6	0.259	7.7	LOS A	0.0	0.0	0.00	0.60	0.00	60.7
28	T1	647	6.7	647	6.7	0.336	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	77.3
Approach		1098	5.0	1098	5.0	0.336	3.2	NA	0.0	0.0	0.00	0.25	0.00	72.0
All Vehicles		2382	4.2	2382	4.2	0.794	5.2	NA	7.0	50.0	0.15	0.33	0.34	67.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [4B. 2 Sneaths Rd / Lismore Rd - Background Growth PM (Site Folder: 4. Background Growth PM)]

Network: N101 [4 Background Growth PM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 2:00Pm-6:00Pm
Peak Hour: 3:30Pm-4:30Pm
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Lismore Rd (SE)														
21	L2	209	3.0	209	3.0	0.097	5.2	LOS A	0.6	4.2	0.39	0.54	0.39	49.9
23a	R1	22	4.8	22	4.8	0.097	8.5	LOS A	0.5	3.8	0.40	0.56	0.40	49.3
23u	U	3	0.0	3	0.0	0.097	11.4	LOS B	0.5	3.8	0.40	0.56	0.40	55.0
Approach		235	3.1	235	3.1	0.097	5.6	LOS A	0.6	4.2	0.39	0.54	0.39	49.9
North: Sneaths Rd (N)														
7a	L1	60	3.5	60	3.5	0.277	7.1	LOS A	1.7	12.3	0.64	0.72	0.64	51.8
9a	R1	184	2.3	184	2.3	0.277	10.6	LOS B	1.7	12.3	0.64	0.72	0.64	45.9
9u	U	1	0.0	1	0.0	0.277	13.5	LOS B	1.7	12.3	0.64	0.72	0.64	45.9
Approach		245	2.6	245	2.6	0.277	9.8	LOS A	1.7	12.3	0.64	0.72	0.64	48.0
SouthWest: Sneaths Rd (SW)														
30a	L1	89	7.1	89	7.1	0.312	2.6	LOS A	1.8	12.6	0.12	0.61	0.12	27.0
32	R2	389	1.4	389	1.4	0.312	6.9	LOS A	1.8	12.6	0.12	0.61	0.12	51.0
32u	U	1	0.0	1	0.0	0.312	8.8	LOS A	1.8	12.6	0.12	0.61	0.12	27.0
Approach		480	2.4	480	2.4	0.312	6.1	LOS A	1.8	12.6	0.12	0.61	0.12	49.5
All Vehicles		960	2.6	960	2.6	0.312	6.9	LOS A	1.8	12.6	0.32	0.62	0.32	49.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 103 [4C. 3 Sneaths Rd / TAFE Entry - Background Growth PM (Site Folder: 4. Background Growth PM)]

Network: N101 [4 Background Growth PM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 2:00pm-6:00pm
Peak Hour: 3:30pm-4:30pm
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Sneaths Rd (S)														
1	L2	39	5.4	39	5.4	0.022	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	48.7
2	T1	73	7.2	73	7.2	0.040	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		112	6.6	112	6.6	0.040	2.0	NA	0.0	0.0	0.00	0.20	0.00	56.2
North: Sneaths Rd (N)														
8	T1	44	7.1	44	7.1	0.024	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	8	12.5	8	12.5	0.007	6.0	LOS A	0.0	0.2	0.22	0.55	0.22	37.7
Approach		53	8.0	53	8.0	0.024	1.0	NA	0.0	0.2	0.04	0.09	0.04	54.1
West: TAFE Entry (W)														
10	L2	54	2.0	54	2.0	0.301	6.8	LOS A	1.4	10.2	0.32	0.88	0.32	35.7
12	R2	205	1.5	205	1.5	0.301	7.6	LOS A	1.4	10.2	0.32	0.88	0.32	15.8
Approach		259	1.6	259	1.6	0.301	7.5	LOS A	1.4	10.2	0.32	0.88	0.32	23.1
All Vehicles		423	3.7	423	3.7	0.301	5.2	NA	1.4	10.2	0.20	0.60	0.20	42.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
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 [5A. 1 Bruxner Hwy / Sneaths Rd - Students&Staff growth AM (Site Folder: 5. Future - Students&Staff Growth AM)]

Network: N101 [5 Future Students&Staff Growth AM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 6:00am-10:00am
Peak Hour: 7:30am-8:30am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Bruxner Hwy (SE)														
22	T1	1011	5.2	1011	5.2	0.536	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	77.0
23	R2	65	1.6	65	1.6	0.089	10.6	LOS B	0.3	2.5	0.62	0.83	0.62	52.9
Approach		1076	5.0	1076	5.0	0.536	0.8	NA	0.3	2.5	0.04	0.05	0.04	75.9
NorthEast: Sneaths Rd (NE)														
24	L2	11	0.0	11	0.0	0.015	7.6	LOS A	0.1	0.4	0.58	0.70	0.58	54.8
26	R2	340	3.4	340	3.4	1.036	92.4	LOS F	15.9	114.3	1.00	2.50	6.42	16.3
Approach		351	3.3	351	3.3	1.036	89.8	LOS F	15.9	114.3	0.99	2.45	6.24	16.7
NorthWest: Bruxner Hwy (NW)														
27	L2	462	2.1	462	2.1	0.265	7.6	LOS A	0.0	0.0	0.00	0.60	0.00	59.8
28	T1	745	4.9	745	4.9	0.383	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	77.2
Approach		1207	3.8	1207	3.8	0.383	3.0	NA	0.0	0.0	0.00	0.23	0.00	72.1
All Vehicles		2634	4.2	2634	4.2	1.036	13.7	NA	15.9	114.3	0.15	0.45	0.85	57.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [5B. 2 Sneaths Rd / Lismore Rd - Students&Staff Growth AM (Site Folder: 5. Future - Students&Staff Growth AM)]

Network: N101 [5 Future Students&Staff Growth AM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 6:00am-10:00am
Peak Hour: 7:30am-8:30am
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Lismore Rd (SE)														
21	L2	244	3.0	244	3.0	0.131	4.9	LOS A	2.2	15.5	0.30	0.52	0.30	50.4
23a	R1	42	2.5	42	2.5	0.131	8.2	LOS A	2.2	15.5	0.31	0.56	0.31	48.9
23u	U	3	0.0	3	0.0	0.131	11.1	LOS B	2.2	15.5	0.31	0.56	0.31	54.8
Approach		289	2.9	289	2.9	0.131	5.4	LOS A	2.2	15.5	0.30	0.52	0.30	50.2
North: Sneaths Rd (N)														
7a	L1	27	3.8	27	3.8	0.245	6.3	LOS A	4.2	30.2	0.55	0.68	0.55	52.2
9a	R1	106	4.0	106	4.0	0.245	9.9	LOS A	4.2	30.2	0.55	0.68	0.55	46.5
9u	U	1	0.0	1	0.0	0.245	12.7	LOS B	4.2	30.2	0.55	0.68	0.55	46.5
Approach		135	3.9	135	3.9	0.245	9.2	LOS A	4.2	30.2	0.55	0.68	0.55	48.2
SouthWest: Sneaths Rd (SW)														
30a	L1	199	2.1	199	2.1	0.356	2.7	LOS A	2.0	14.2	0.17	0.57	0.17	28.0
32	R2	328	1.9	328	1.9	0.356	7.0	LOS A	2.0	14.2	0.17	0.57	0.17	51.8
32u	U	1	0.0	1	0.0	0.356	8.9	LOS A	2.0	14.2	0.17	0.57	0.17	28.0
Approach		528	2.0	528	2.0	0.356	5.4	LOS A	2.0	14.2	0.17	0.57	0.17	48.5
All Vehicles		953	2.5	953	2.5	0.356	5.9	LOS A	4.2	30.2	0.27	0.57	0.27	49.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 103 [5C. 3 Sneaths Rd / TAFE Entry - Students&Staff Growth AM (Site Folder: 5. Future - Students&Staff Growth AM)]

Network: N101 [5 Future Students&Staff Growth AM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 6:00am-10:00am
Peak Hour: 7:30am-8:30am
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Sneaths Rd (S)														
1	L2	211	1.0	211	1.0	0.118	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	48.8
2	T1	32	10.0	32	10.0	0.018	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		242	2.2	242	2.2	0.118	4.9	NA	0.0	0.0	0.00	0.50	0.00	50.3
North: Sneaths Rd (N)														
8	T1	89	4.7	89	4.7	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	64	3.3	64	3.3	0.058	6.5	LOS A	0.2	1.6	0.34	0.60	0.34	37.1
Approach		154	4.1	154	4.1	0.058	2.7	NA	0.2	1.6	0.14	0.25	0.14	46.8
West: TAFE Entry (W)														
10	L2	9	22.2	9	22.2	0.074	6.7	LOS A	0.3	2.1	0.24	0.94	0.24	32.3
12	R2	43	2.4	43	2.4	0.074	8.4	LOS A	0.3	2.1	0.24	0.94	0.24	15.5
Approach		53	6.0	53	6.0	0.074	8.1	LOS A	0.3	2.1	0.24	0.94	0.24	21.4
All Vehicles		448	3.3	448	3.3	0.118	4.5	NA	0.3	2.1	0.08	0.47	0.08	48.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
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 [6A. 1 Bruxner Hwy / Sneaths Rd - Students&Staff Growth PM (Site Folder: 6. Future - Students&Staff Growth PM)]

Network: N101 [6 Future Students&Staff Growth PM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 2:00pm-6:00pm
Peak Hour: 3:30pm-4:30pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Bruxner Hwy (SE)														
22	T1	860	4.0	860	4.0	0.453	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	77.1
23	R2	33	0.0	33	0.0	0.038	9.6	LOS A	0.1	1.0	0.57	0.75	0.57	55.5
Approach		893	3.9	893	3.9	0.453	0.5	NA	0.1	1.0	0.02	0.03	0.02	76.6
NorthEast: Sneaths Rd (NE)														
24	L2	77	0.0	77	0.0	0.096	7.1	LOS A	0.4	2.5	0.56	0.76	0.56	55.1
26	R2	375	2.8	375	2.8	0.899	34.7	LOS D	11.3	80.7	0.95	1.71	3.45	30.7
Approach		452	2.3	452	2.3	0.899	30.0	LOS D	11.3	80.7	0.88	1.55	2.96	33.3
NorthWest: Bruxner Hwy (NW)														
27	L2	458	2.5	458	2.5	0.263	7.7	LOS A	0.0	0.0	0.00	0.60	0.00	60.5
28	T1	647	6.7	647	6.7	0.336	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	77.3
Approach		1105	5.0	1105	5.0	0.336	3.2	NA	0.0	0.0	0.00	0.25	0.00	71.9
All Vehicles		2449	4.1	2449	4.1	0.899	7.2	NA	11.3	80.7	0.17	0.41	0.55	64.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [6B. 2 Sneaths Rd / Lismore Rd - Students&Staff Growth PM (Site Folder: 6. Future - Students&Staff Growth PM)]

Network: N101 [6 Future Students&Staff Growth PM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 2:00Pm-6:00Pm
Peak Hour: 3:30Pm-4:30Pm
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Lismore Rd (SE)														
21	L2	209	3.0	209	3.0	0.112	5.5	LOS A	0.7	5.0	0.45	0.57	0.45	49.5
23a	R1	26	4.0	26	4.0	0.112	8.9	LOS A	0.5	3.8	0.46	0.59	0.46	48.7
23u	U	3	0.0	3	0.0	0.112	11.7	LOS B	0.5	3.8	0.46	0.59	0.46	54.7
Approach		239	3.1	239	3.1	0.112	6.0	LOS A	0.7	5.0	0.46	0.57	0.46	49.6
North: Sneaths Rd (N)														
7a	L1	78	2.7	78	2.7	0.427	7.3	LOS A	2.4	16.8	0.67	0.75	0.67	51.6
9a	R1	241	1.7	241	1.7	0.427	10.8	LOS B	2.4	16.8	0.67	0.75	0.67	45.7
9u	U	1	0.0	1	0.0	0.427	13.7	LOS B	2.4	16.8	0.67	0.75	0.67	45.7
Approach		320	2.0	320	2.0	0.427	10.0	LOS A	2.4	16.8	0.67	0.75	0.67	47.8
SouthWest: Sneaths Rd (SW)														
30a	L1	100	6.3	100	6.3	0.322	2.7	LOS A	1.9	13.4	0.14	0.60	0.14	27.0
32	R2	389	1.4	389	1.4	0.322	6.9	LOS A	1.9	13.4	0.14	0.60	0.14	51.0
32u	U	1	0.0	1	0.0	0.322	8.8	LOS A	1.9	13.4	0.14	0.60	0.14	27.0
Approach		491	2.4	491	2.4	0.322	6.0	LOS A	1.9	13.4	0.14	0.60	0.14	49.4
All Vehicles		1049	2.4	1049	2.4	0.427	7.2	LOS A	2.4	16.8	0.37	0.64	0.37	48.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

MOVEMENT SUMMARY

Site: 103 [6C. 3 Sneaths Rd / TAFE Entry - Students&Staff Growth PM (Site Folder: 6. Future - Students&Staff Growth PM)]

Network: N101 [6 Future Students&Staff Growth PM (Network Folder: General)]

Survey Date: 14/03/2023
Survey Time: 2:00pm-6:00pm
Peak Hour: 3:30pm-4:30pm
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Sneaths Rd (S)														
1	L2	54	3.9	54	3.9	0.031	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	48.7
2	T1	73	7.2	73	7.2	0.040	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		126	5.8	126	5.8	0.040	2.4	NA	0.0	0.0	0.00	0.24	0.00	55.3
North: Sneaths Rd (N)														
8	T1	44	7.1	44	7.1	0.024	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	11	10.0	11	10.0	0.009	6.1	LOS A	0.0	0.3	0.23	0.55	0.23	37.7
Approach		55	7.7	55	7.7	0.024	1.2	NA	0.0	0.3	0.04	0.11	0.04	53.1
West: TAFE Entry (W)														
10	L2	73	1.4	73	1.4	0.414	6.6	LOS A	2.2	15.8	0.37	0.88	0.37	36.6
12	R2	281	1.1	281	1.1	0.414	7.7	LOS A	2.2	15.8	0.37	0.88	0.37	16.6
Approach		354	1.2	354	1.2	0.414	7.5	LOS A	2.2	15.8	0.37	0.88	0.37	24.1
All Vehicles		535	3.0	535	3.0	0.414	5.6	NA	2.2	15.8	0.25	0.65	0.25	41.5

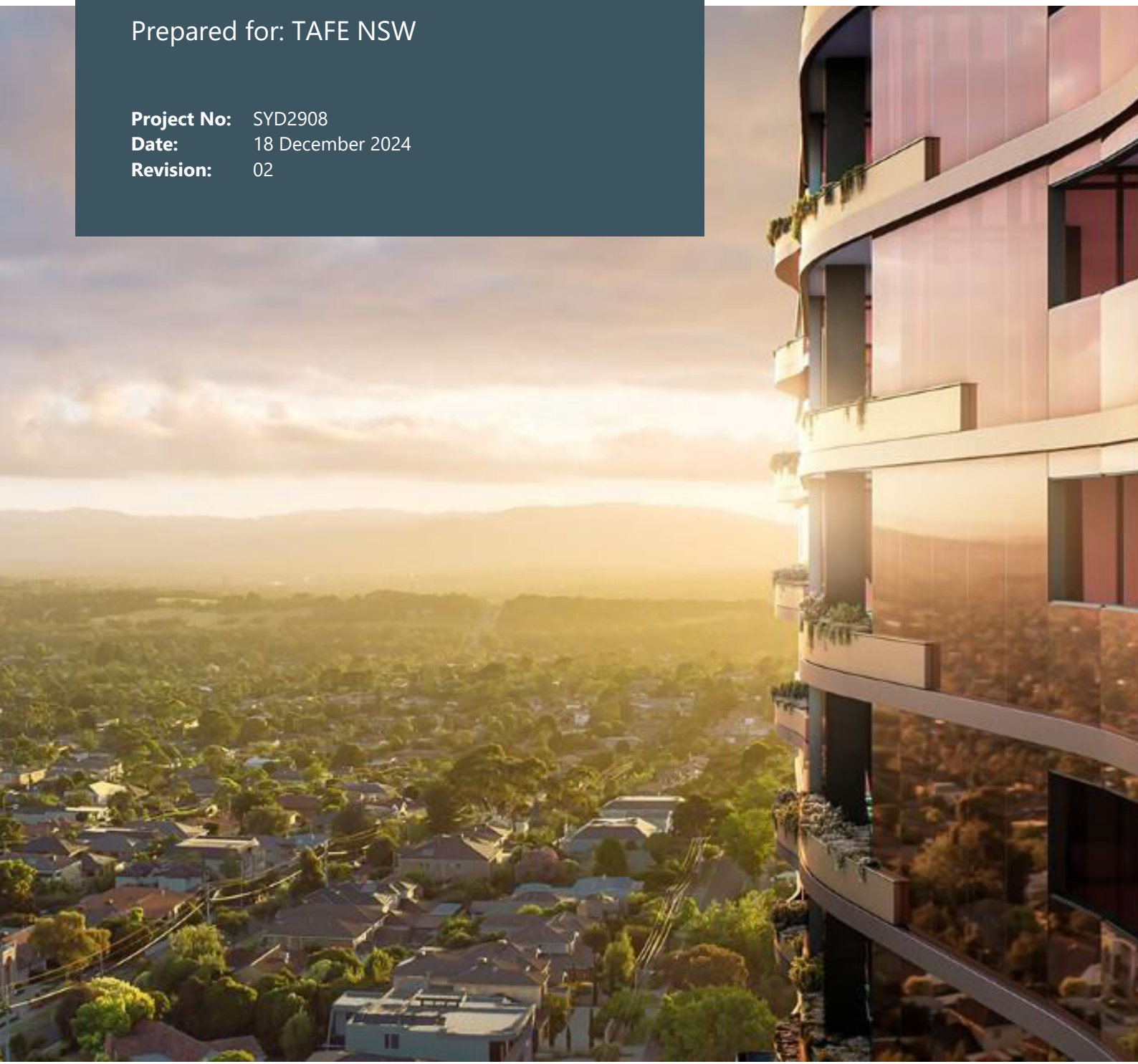
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and 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).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

TAFE HDC WOLLONGBAR CAMPUS STAGE 2

Civil Engineering Design Report

Prepared for: TAFE NSW

Project No: SYD2908
Date: 18 December 2024
Revision: 02



Project:	TAFE HDC WOLLONGBAR CAMPUS STAGE 2
Location:	61 Sneaths Road Wollongbar, NSW
Prepared by:	ADP Consulting Pty Ltd Level 6, 33 Erskine Street Sydney NSW 2000
Project No:	SYD2908
Revision:	02
Date:	18 December 2024

Rev	Date	Comment	Author	Signature	Technical Review	Signature	Authorisation & QA	Signature
01	12.12.24		M.H.		S.S		S.S	
02	18.12.24		M.H.		S.S		S.S	

Contents

1. Introduction 3

2. Existing Site Characteristics 4

2.1 Property Detail 4

2.2 Site Topography 4

2.3 Existing Stormwater Infrastructure 4

3. Stormwater Management 5

3.1 Surface Drainage 5

3.2 Roof Drainage 5

3.3 Stormwater Quantity 5

3.4 Discharge Point 6

4. Water Quality 7

4.1 Water Pollutant Reduction Targets 7

4.2 Water Treatment Train 7

4.3 Drinking Water Catchment 8

5. Soil and Water Management Plan 9

Figures

Figure 1 Proposed Work Within Site 3

Figure 2 MUSIC Treatment Train and Results 8

Figure 3 Pre-Post Pollutant Reduction 8

Tables

Table 1 - Detention System Summary Table 6

1. Introduction

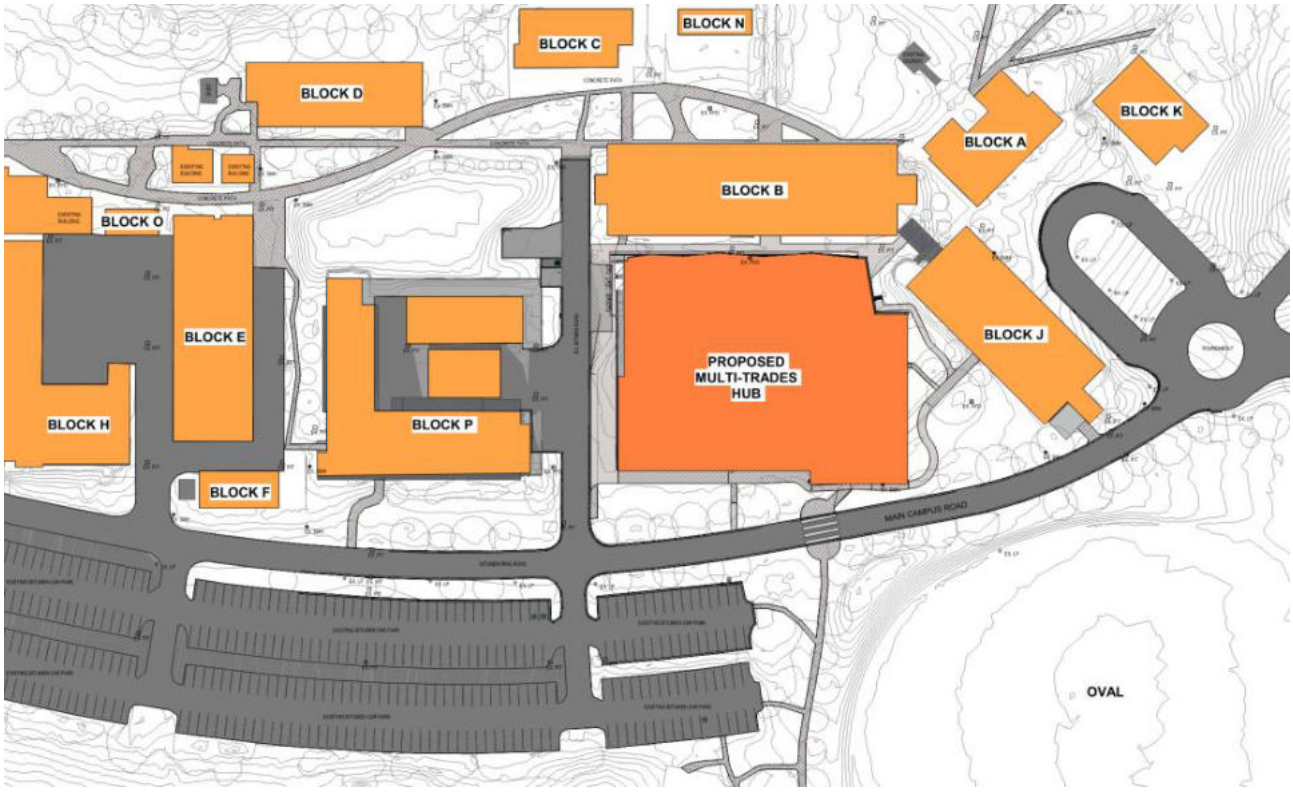
This Civil Engineering Design Report is prepared by ADP consulting Engineers on behalf of TAFE NSW to accompany the Development Application (DA) of TAFE HDC Wollongbar Campus Stage 2 at 61 Sneaths Road, Wollongbar NSW.

The site is currently located within the existing TAFE Wollongbar campus with several existing building blocks, which is partially located within the Wilsons River drinking water catchment. Proposed work as part of this DA includes demolition of an existing tennis court field and construction of new proposed multi-trades hub building within the campus.

This report addresses the following items to seek consent for a proposed alteration and addition works on the existing development:

- Stormwater runoff and legal point of discharge;
- Water Sensitive Urban Design (WSUD) and stormwater quality treatment measures (NorBE);
- Sediment and Erosion Control

Figure 1 Proposed Work Within Site



2. Existing Site Characteristics

2.1 Property Detail

The proposed development is located at 61 Sneaths Road, Wollongbar within the TAFE Wollongbar Campus. The proposed development is proposed over an existing tennis court and lawn.

The proposed development is bounded by:

- An existing building, block B to the North
- An existing building, block J to the East
- Internal road servicing the campus to the South and the West

2.2 Site Topography

Based on the survey plan titled "Partial Detail Survey of Lot 10 in DP874987 61 Sneaths Road Wollongbar NSW 2477 rev.B", prepared by Barnson Pty Ltd. Prepared for TAFE NSW dated 06/04/2023, the existing site topography indicates that the site falls primarily North to South, with the highest point of the site located in the North at a level of RL 174.4 mAHD and the low point located in the South at a level of RL 173.45 mAHD. This is an average slope of approximately 1.7%. Refer to Appendix B for survey plan.

2.3 Existing Stormwater Infrastructure

Existing stormwater infrastructure has been identified around the site, which have been confirmed based on the survey plan titled, "Partial Detail Survey of Lot 10 in DP874987 61 Sneaths Road Wollongbar NSW 2477 rev.B", prepared by Barnson Pty Ltd. Prepared for TAFE NSW dated 06/04/2023. An updated version of the survey plan titled "Partial Detail Survey of Lot 10 in DP874987 61 Sneaths Road Wollongbar NSW 2477 rev.C", showing additional underground services has also been provided.

Based on the survey plans that have been prepared, there is an existing pit and below ground network that is currently servicing the TAFE Wollongbar campus. The existing stormwater drainage infrastructures are expected to remain to service the campus.

An existing sewer manhole and sewer drainage line has been identified South of the proposed development. All existing infrastructure outside of the proposed building extent are to be retained, whereas any infrastructure located within the proposed building extent will be disused and relocated. Please refer to Appendix B for survey plan.

3. Stormwater Management

This section of the report discusses the proposed system to allow for stormwater runoff across the site to be conveyed to the designated legal point of discharge.

3.1 Surface Drainage

The new proposed Multi-Trades Hub consists of mainly non-trafficable roof and some new impervious area. All roof drainage is to be captured and conveyed to the proposed stormwater treatment and detention system. Whereas surface runoff outside of the proposed building will be captured and conveyed through the proposed stormwater pits and pipes network. Any surface runoff unable to be captured and drain towards the proposed detention system will drain towards existing stormwater inlet structures within the site.

3.2 Roof Drainage

Non-trafficable roof areas are directed into a proposed 20,000 L rainwater tank, where rainwater will be stored and re-used. Excess inlet flows into the rainwater tank will overflow into the proposed Filterra bio-retention system for water quality treatment purposes. The drainage system will be designed to convey the minor storm event runoff from the roof to the proposed in-ground drainage system, while excess flows from the roof during the major storm event will surcharge the roof drainage system and discharge into surrounding ground, where it will be captured by the existing stormwater system.

3.3 Stormwater Quantity

In accordance with Ballina Shire Council "Stormwater Management Standards for Development" Section 2.3.3, it is required to ensure that there is no adverse impact on existing downstream area due to the proposed development. Considering the existing site consists of greenfield lawn, whereas the proposed work consists mainly of impervious surface, a detention system is required for the development to ensure no increase in stormwater runoff discharge from the site in the pre to post scenario. The proposed below-ground on-site detention system has been sized to limit the post-development site peak discharge back to the pre-development condition for the nominated design storm.

In accordance with the Balina Shire Council – "Urban Stormwater Management Plan – Volume 1", the design storm for minor and major storm is typically ten (10) year storm and hundred (100) year storm respectively. Therefore, the proposed detention system has been sized to limit the peak post-development site discharge to less than or equal to the pre-development condition for all storm events from the ten (10) year storm up to the hundred (100) year storm. DRAINS model is used to determine site runoff for both the pre-development and post-development scenarios.

Refer to Table 1 below for summary of pre-development and post-development peak site discharge.

Table 1 - Detention System Summary Table

Storm Event (Year)	Pre-Dev Peak Site Discharge (L/s)	Post-Dev Controlled OSD Discharge (L/s)	Post-Dev Bypass (L/s)	Post-Dev Peak Site Discharge (L/s)	Required OSD Volume (m^3)
10	123	115	7	122	18.9
20	147	116	8	124	27.0
50	173	119	9	128	38.8
100	192	133	10	143	96.5

Therefore, to ensure no adverse impact on existing downstream stormwater drainage infrastructure, a 99m^3 below ground on-site detention tank has been proposed for the development to limit post-development peak site discharge back to pre-development condition.

3.4 Discharge Point

Existing stormwater drainage infrastructures have been identified based on the site survey plans prepared. There is an existing stormwater kerb inlet pit opposite of the site, with outlet pipe discharging to a creek via an existing headwall. The existing stormwater infrastructures are to remain, and the outlet pipe from the proposed below-ground detention systems are to connect to this existing below ground stormwater infrastructure.

4. Water Quality

4.1 Water Pollutant Reduction Targets

In accordance with Ballina Shire Council "Stormwater Management Standards for Development" Section 2.3.3 the following reduction in average annual pollutant load reduction need to be achieved:

- Total Suspended Solids : 80% reduction
- Total Phosphorus : 60% reduction
- Total Nitrogen : 45% reduction

As part of TAFE's initiative to sustainable design, TAFE NSW has a separate design standard to achieve "Sustainable Design", which stated that for a proposed work of this scale, the following reduction in average annual pollutant load reduction need to be achieved:

- Average Stormwater Discharge : 40% reduction
- Total Suspended Solids : 85% reduction
- Total Phosphorus : 65% reduction
- Total Nitrogen : 45% reduction

As the TAFE NSW criteria for water quality is stricter than Ballina Shire Council water quality targets criteria, TAFE NSW reduction targets have been adopted for the proposed development.

4.2 Water Treatment Train

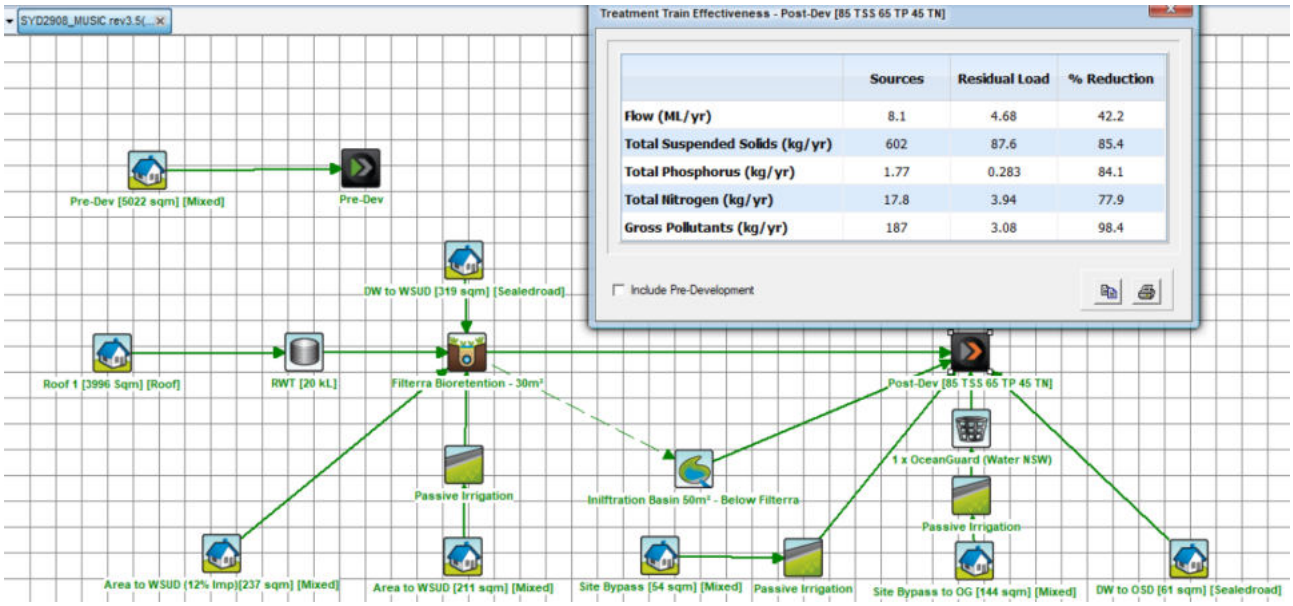
The proposed development consists of mainly non-trafficable roof, with majority of the catchment draining towards the proposed 20,000 kL rainwater tank, which will contribute to rainwater re-use for the development.

Roof catchment draining to the 20,000 kL rainwater tank will be stored and re-used within the development. It is assumed that harvested rainwater will be reuse for multiple purposes, such as urinals, toilets and wash down. Based on the mentioned re-use proposes, daily rainwater re-use value of 4.5 kL/day is adopted for MUSIC modelling. With the re-use of harvested rainwater, 40% reduction in average annual stormwater discharge has been achieved.

Overflow from the rainwater tank will then drain towards the proposed Filterra bio-retention basin for water quality treatment before discharging to the proposed detention system. Impervious catchment not able to drain towards the proposed bio-retention system is treated with OceanGuard baskets.

The proposed stormwater treatment train were modelled in MUSIC, and it has been demonstrated that the stormwater quality targets have been achieved through the provision of a bio-retention basin and two Oceanguard baskets (refer to Appendix A and Figure 2 below).

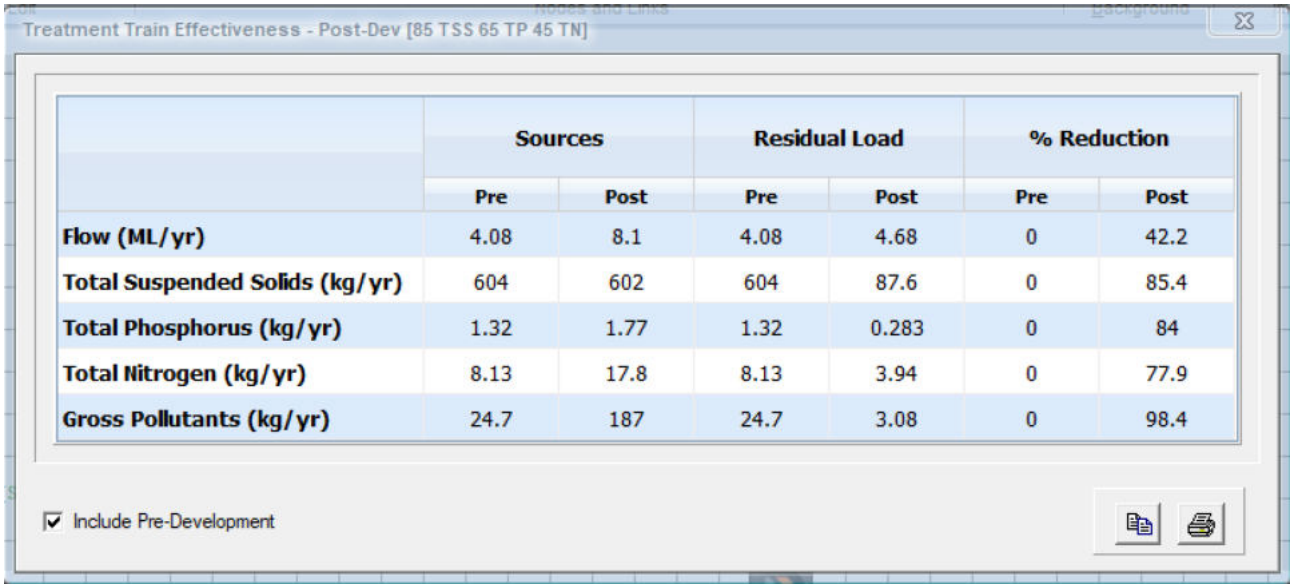
Figure 2 MUSIC Treatment Train and Results



4.3 Drinking Water Catchment

The site is located partially within the Wilson River Catchment, which is part of Rous County Council drinking water catchment. In accordance with the guidelines "Development Control in the Rous Water Supply Catchment Areas", development within the drinking water catchment will need to demonstrate that "neutral or beneficial effect on water quality (NorBE)" need to be achieved. Pre to post pollutant summary result has been extracted in Figure 3, and it has been demonstrated that pollutant residual load for the post-development scenario is less than the pre-development. Therefore, NorBE has been achieved.

Figure 3 Pre-Post Pollutant Reduction



	Sources		Residual Load		% Reduction	
	Pre	Post	Pre	Post	Pre	Post
Flow (ML/yr)	4.08	8.1	4.08	4.68	0	42.2
Total Suspended Solids (kg/yr)	604	602	604	87.6	0	85.4
Total Phosphorus (kg/yr)	1.32	1.77	1.32	0.283	0	84
Total Nitrogen (kg/yr)	8.13	17.8	8.13	3.94	0	77.9
Gross Pollutants (kg/yr)	24.7	187	24.7	3.08	0	98.4

5. Soil and Water Management Plan

Sedimentation and erosion control involves the measures incorporated during and following construction of a new development to mitigate and prevent the pollution and degradation of the downstream watercourse. A Sediment and Erosion Control Plan has been prepared as part of the development application (DA) documentation and has been included in Appendix A of this report. A Design guide titled "Managing Urban Stormwater – Soils and Construction Volume 1" published by Landcom has been used as a reference manual in preparing the Soil and Water Management Plan.

APPENDIX A – STORMWATER MANAGEMENT PLAN

PROPOSED TAFE MULTI-TRADES HUB
61 SNEATHS ROAD, WOLLONGBAR NSW 2477

LOCALITY PLAN
SOURCE: SIXMAPS - 11.12.2024
NOT TO SCALE

DRAWING SCHEDULE	
DRAWING NO.	DRAWING NAME
CE000	COVER SHEET
CE100	GENERAL ARRANGEMENT PLAN
CE110	STORMWATER MANAGEMENT PLAN
CE150	MUSIC CATCHMENT PLAN
CE200	CIVIL DRAINAGE DETAILS - SHEET 1
CE201	CIVIL DRAINAGE DETAILS - SHEET 2
CE300	SEDIMENT AND EROSION CONTROL PLAN
CE305	SEDIMENT AND EROSION CONTROL DETAILS

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

BEFORE YOU DIG www.byda.com.au

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

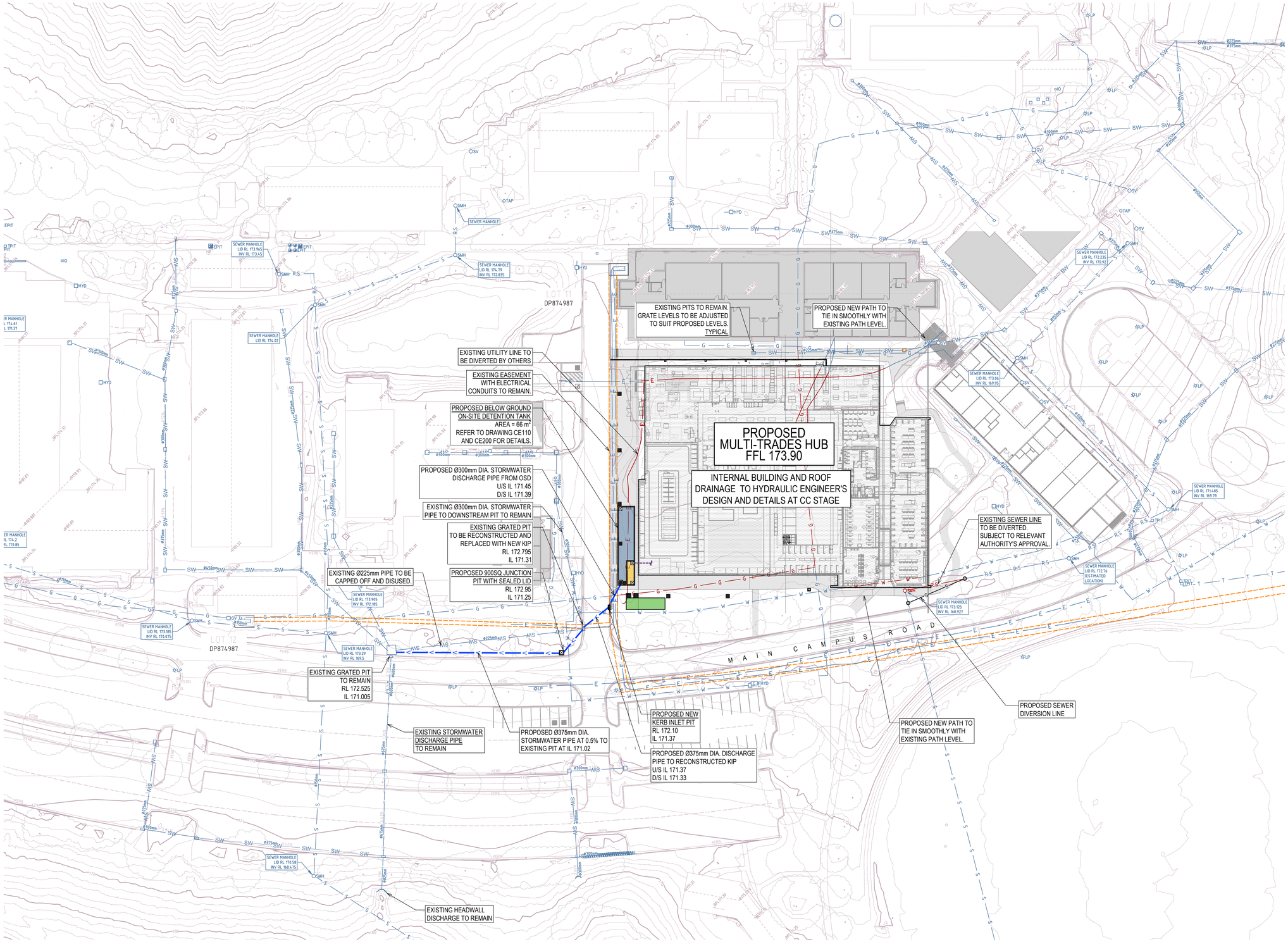
Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
COVER SHEET

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024		@ A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE000	B	



LEGEND

- SITE BOUNDARY
- EASEMENT BOUNDARY AND EXTENT
- PROPOSED STORMWATER LINE
- PROPOSED DRAINAGE LINE (BY HYDRAULIC ENGINEER)
- SUBSOIL LINE
- PROPOSED GRATED DRAIN
- EXISTING STORMWATER LINE
- EXISTING ELECTRICAL LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING UTILITY LINE TO BE DIVERTED
- PROPOSED NEW UTILITY LINE
- BATTER LINE
- GRATED SURFACE INLET PIT
- SEALED JUNCTION PIT
- FINISHED RL

NOTES:

1. ALL STORMWATER PIPES ARE Ø100mm uPVC @1% MIN. GRADE UNLESS NOTED OTHERWISE.
2. ALL SUBSOIL PIPES ARE Ø100mm AG PIPE.
3. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE
4. BASEMENT SLAB MIN FALL 1% TOWARDS RWO, FW, PITS TO MEET REQUIREMENTS OF AS:2890.
5. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS,GTD, GPT, RWO AND PD ARE TO BE LIGHT DUTY OR CLASS B IN LANDSCAPE AREA U.N.O.
6. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS,GTD, GPT, RWO AND PD ARE TO BE HEAVY DUTY OR CLASS D IN DRIVEWAY AREA U.N.O.
7. SURVEY INFORMATION HAS BEEN OBTAINED FROM SURVEY PLAN PREPARED BY BARNSON PTY LTD TITLED 'PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987' - REF 40701-L01 DATED 06/04/2023 REV B.
8. EXISTING UTILITIES INFORMATION HAS BEEN OBTAINED FROM SERVICE LOCATOR PLAN PREPARED BY BARNSON PTY LTD TITLED 'PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987' - REF 40701-L01 DATED 16/08/2024 REV C.

SITE PLAN
SCALE 1:500

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

A1 0 5 10 15 20 25 30 35 40 45 50 1:500

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

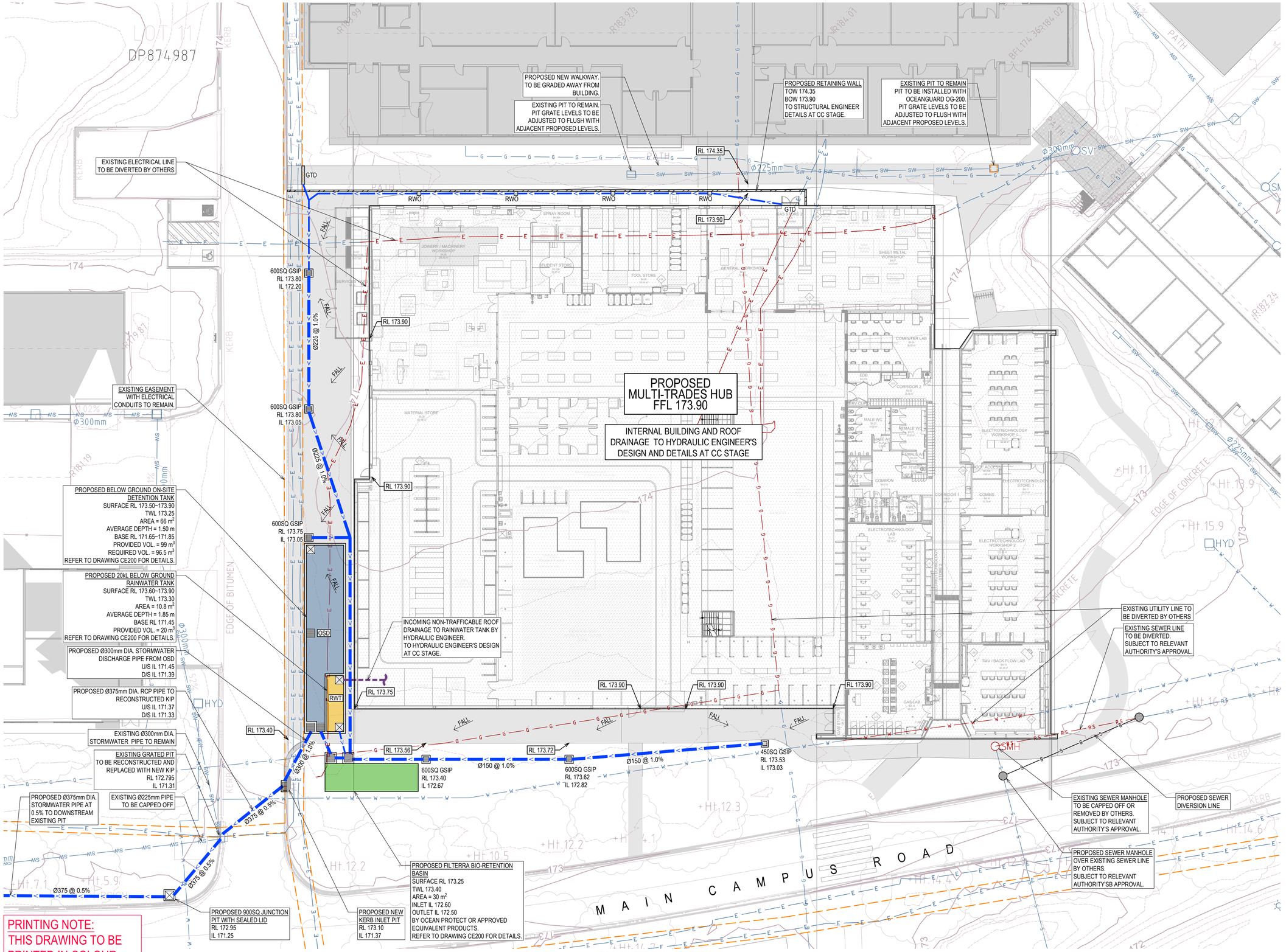
Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
GENERAL ARRANGEMENT PLAN

DEVELOPMENT APPLICATION

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024	1:500 @	A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE100	B	



LEGEND

- SITE BOUNDARY
- EASEMENT BOUNDARY AND EXTENT
- PROPOSED STORMWATER LINE
- PROPOSED DRAINAGE LINE (BY HYDRAULIC ENGINEER)
- SUBSOIL LINE
- PROPOSED GRATED DRAIN
- EXISTING STORMWATER LINE
- EXISTING ELECTRICAL LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING UTILITY LINE TO BE DIVERTED
- PROPOSED NEW UTILITY LINE
- BATTER LINE
- GRATED SURFACE INLET PIT
- SEALED JUNCTION PIT
- FINISHED RL

NOTES:

1. ALL STORMWATER PIPES ARE Ø100mm uPVC @1% MIN. GRADE UNLESS NOTED OTHERWISE.
2. ALL SUBSOIL PIPES ARE Ø100mm AG PIPE.
3. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE
4. BASEMENT SLAB MIN FALL 1% TOWARDS RWO, FW, PITS TO MEET REQUIREMENTS OF AS:2890.
5. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS,GTD, GPT, RWO AND PD ARE TO BE LIGHT DUTY OR CLASS B IN LANDSCAPE AREA U.N.O.
6. GRATE AND FRAME OF STORMWATER COMPONENTS INCLUDING PITS,GTD, GPT, RWO AND PD ARE TO BE HEAVY DUTY OR CLASS D IN DRIVEWAY AREA U.N.O.
7. SURVEY INFORMATION HAS BEEN OBTAINED FROM SURVEY PLAN PREPARED BY BARNSON PTY LTD TITLED 'PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987' - REF 40701-L01 DATED 06/04/2023 REV B.
8. EXISTING UTILIES INFORMATION HAS BEEN OBTAINED FROM SERVICE LOCATOR PLAN PREPARED BY BARNSON PTY LTD TITLED 'PARTIAL DETAIL SURVEY OF LOT 10 IN DP 874987' - REF 40701-L01 DATED 16/08/2024 REV C.

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

STORMWATER MANAGEMENT PLAN
SCALE 1:200

A1 0 2 4 6 8 10 12 14 16 18 20 1:200

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client: TAFE NSW

Architect: EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

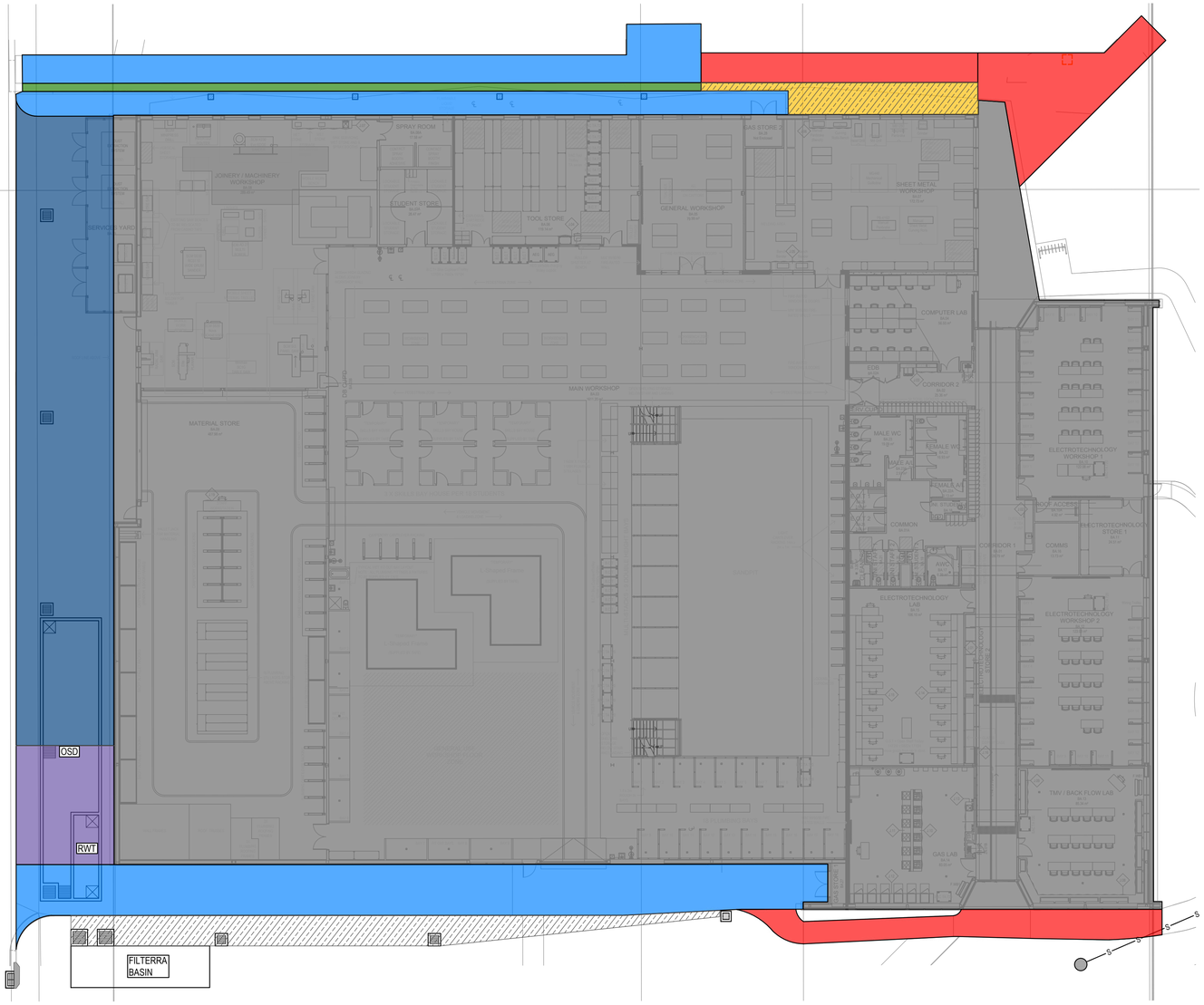
Building Services Consultants: ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project: TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

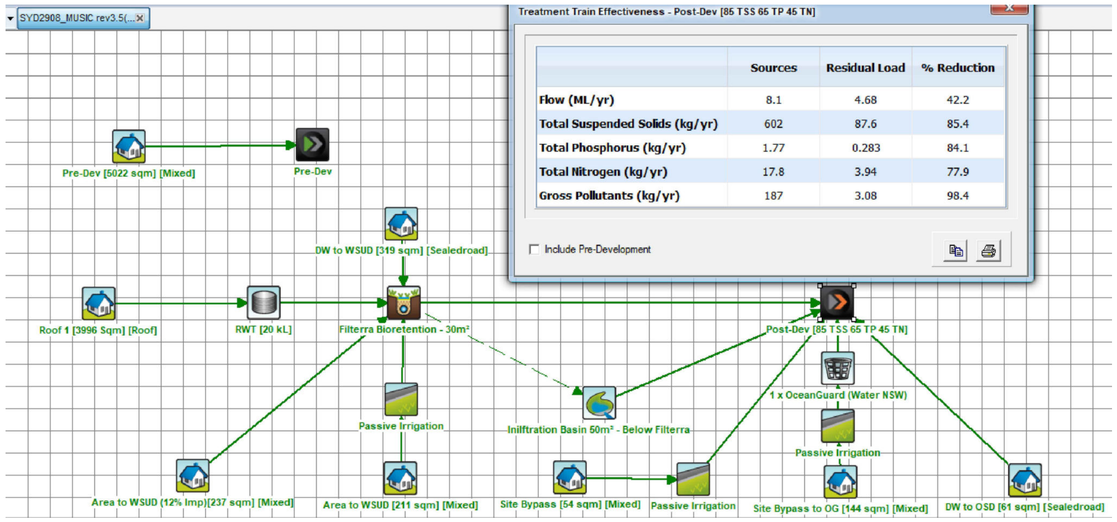
Drawing Title: CIVIL ENGINEERING SERVICES
STORMWATER MANAGEMENT PLAN

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024	1:200	@ A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE110	B	



MUSIC CATCHMENT PLAN
SCALE 1:200



MUSIC TREATMENT TRAIN AND RESULT
NTS

TOTAL CATCHMENT AREA = 5,022 m²

	LANDSCAPE TO WSUD SYSTEM	= 29 m²
	IMPERVIOUS TO WSUD SYSTEM	= 419 m²
	ROOF AREA TO WSUD SYSTEM	= 3,996 m²
	DRIVEWAY TO WSUD SYSTEM	= 319 m²
	DRIVEWAY STRAIGHT TO OSD BYPASSING WSUD SYSTEM	= 61 m²
	IMPERVIOUS BYPASS	= 109 m²
	PERVIOUS BYPASS	= 35 m²
	PASSIVE IRRIGATION (LANDSCAPE)	

WATER QUALITY TARGET

IN ACCORDANCE WITH BALLINA COUNCIL'S DESIGN GUIDELINE 'STORMWATER MANAGEMENT STANDARDS FOR DEVELOPMENT', AT THE MINIMUM THE FOLLOWING POLLUTANT LOAD REDUCTION TARGETS WOULD NEED TO BE ACHIEVED:
- 60% TOTAL SUSPENDED SOLIDS
- 60% TOTAL PHOSPHORUS
- 45% TOTAL NITROGEN
- 90% GROSS POLLUTANTS

HOWEVER, IN ACCORDANCE WITH TAFE 'SUSTAINABLE DESIGN STANDARD' TO ACHIEVE TAFE'S SUSTAINABILITY TARGET THE FOLLOWING REDUCTION TARGETS WOULD NEED TO BE ACHIEVED:
- 40% REDUCTION IN STORMWATER DISCHARGE (ML/YR)
- 85% TOTAL SUSPENDED SOLIDS
- 65% TOTAL PHOSPHORUS
- 45% TOTAL NITROGEN
- 90% GROSS POLLUTANTS

THEREFORE, THE PROPOSED WATER QUALITY SYSTEM HAS BEEN DESIGNED TO ACHIEVE TAFE'S SUSTAINABILITY CRITERIA AS IT IS MORE CRITICAL OF THE TWO.

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

A1 0 2 4 6 8 10 12 14 16 18 20 1:200

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

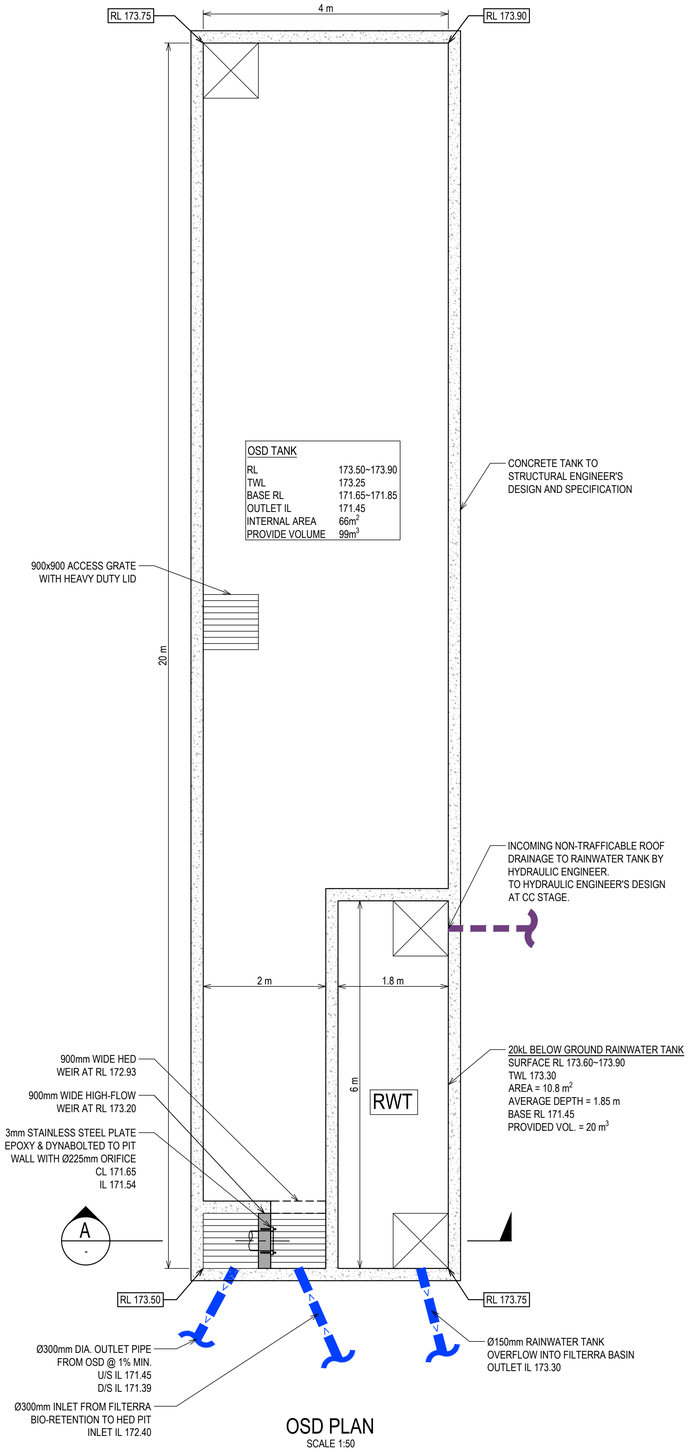
Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
MUSIC CATCHMENT PLAN

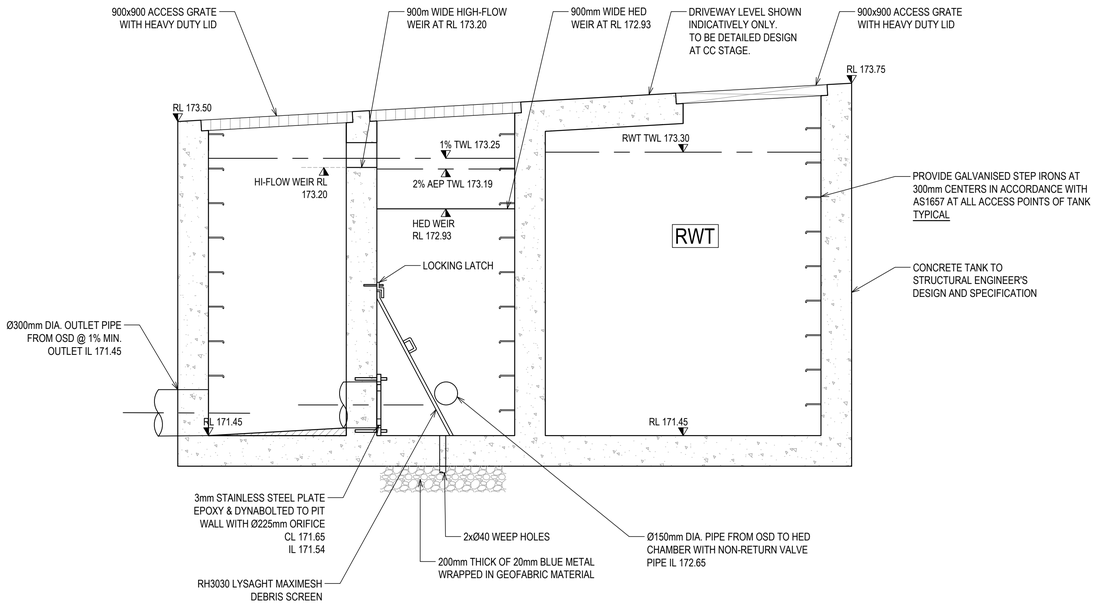
DEVELOPMENT APPLICATION

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024	1:200 @	A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE150	B	



OSD PLAN
SCALE 1:50

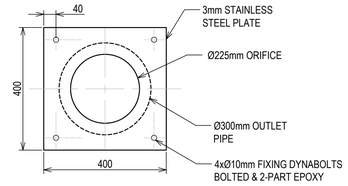


SECTION A
SCALE 1:20

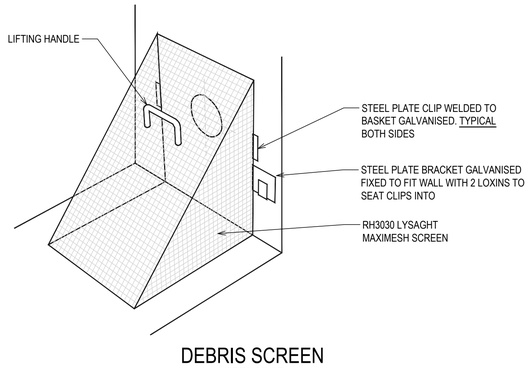
OSD TANK

AEP STORM	PRE-DEV SITE DISCHARGE (L/s)	POST-DEV BYPASS (L/s)	POST-DEV CONTROLLED OSD DISCHARGE (L/s)	POST-DEV TOTAL PEAK SITE DISCHARGE (L/S)	REQUIRED OSD VOLUME (m^3)
10%	123	7	115	122	18.9
5%	147	8	116	124	27.0
2%	173	9	119	128	38.8
1%	192	10	133	143	96.5

DRAINS MODEL PRE-DEV POST-DEV SITE DISCHARGE COMPARISON



ORIFICE PLATE DETAIL
SCALE 1:10



DEBRIS SCREEN
NOT TO SCALE

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

A1 0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 1:50
A1 0 0.5 1.0 1.5 2.0 1:20
A1 0 0.25 0.50 0.75 1.00 1:10

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

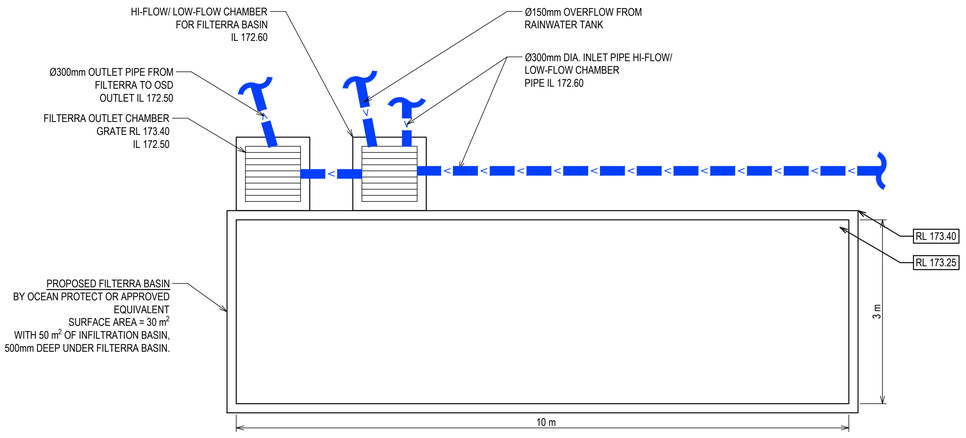
Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

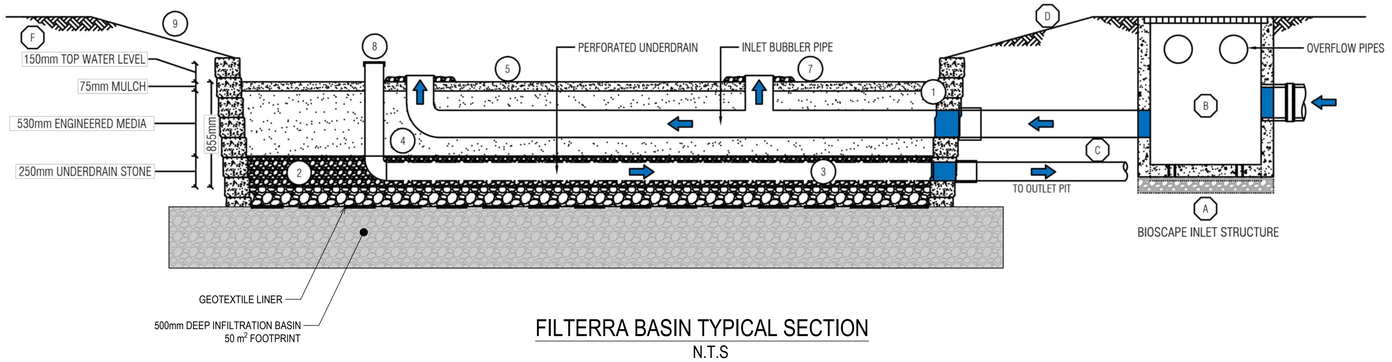
Drawing Title
CIVIL ENGINEERING SERVICES
CIVIL DRAINAGE DETAILS - SHEET 1

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024		@ A1

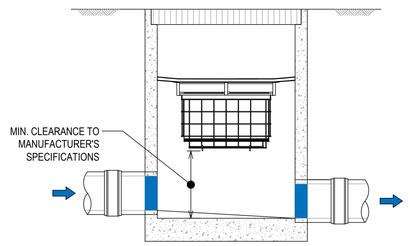
Job Number	Drawing Number	Revision	North Point
SYD2908	CE200	B	



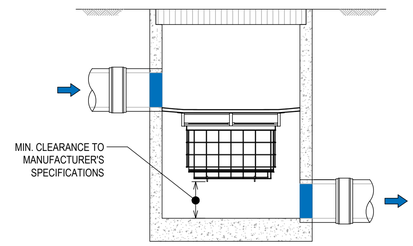
FILTERRA BASIN PLAN
SCALE 1:50



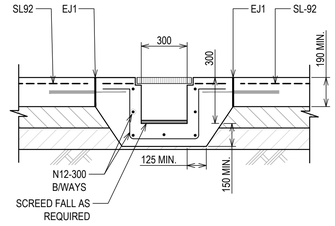
FILTERRA BASIN TYPICAL SECTION
N.T.S



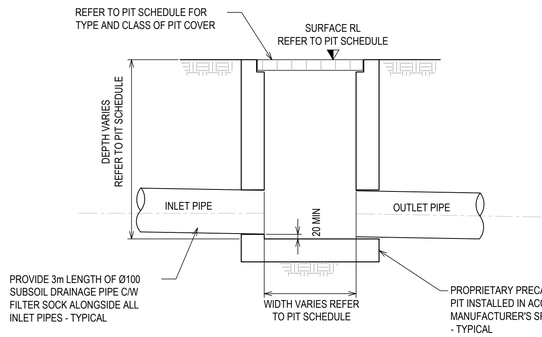
PIT INSERT CONFIGURATION
GRATED SURFACE INLET PIT
SCALE 1:20



PIT INSERT CONFIGURATION
ROOFWATER INLET/END OF LINE
STORMWATER INLET PIT
SCALE 1:20



GRATED TRENCH DRAIN DETAIL
SCALE 1:20



STORMWATER DRAINAGE PIT - PRECAST PIT
SCALE 1:20

PRINTING NOTE:
THIS DRAWING TO BE
PRINTED IN COLOUR.

A1 0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 1:50
A1 0 0.5 1.0 1.5 2.0 2.5 1:25
A1 0 0.5 1.0 1.5 2.0 1:20

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

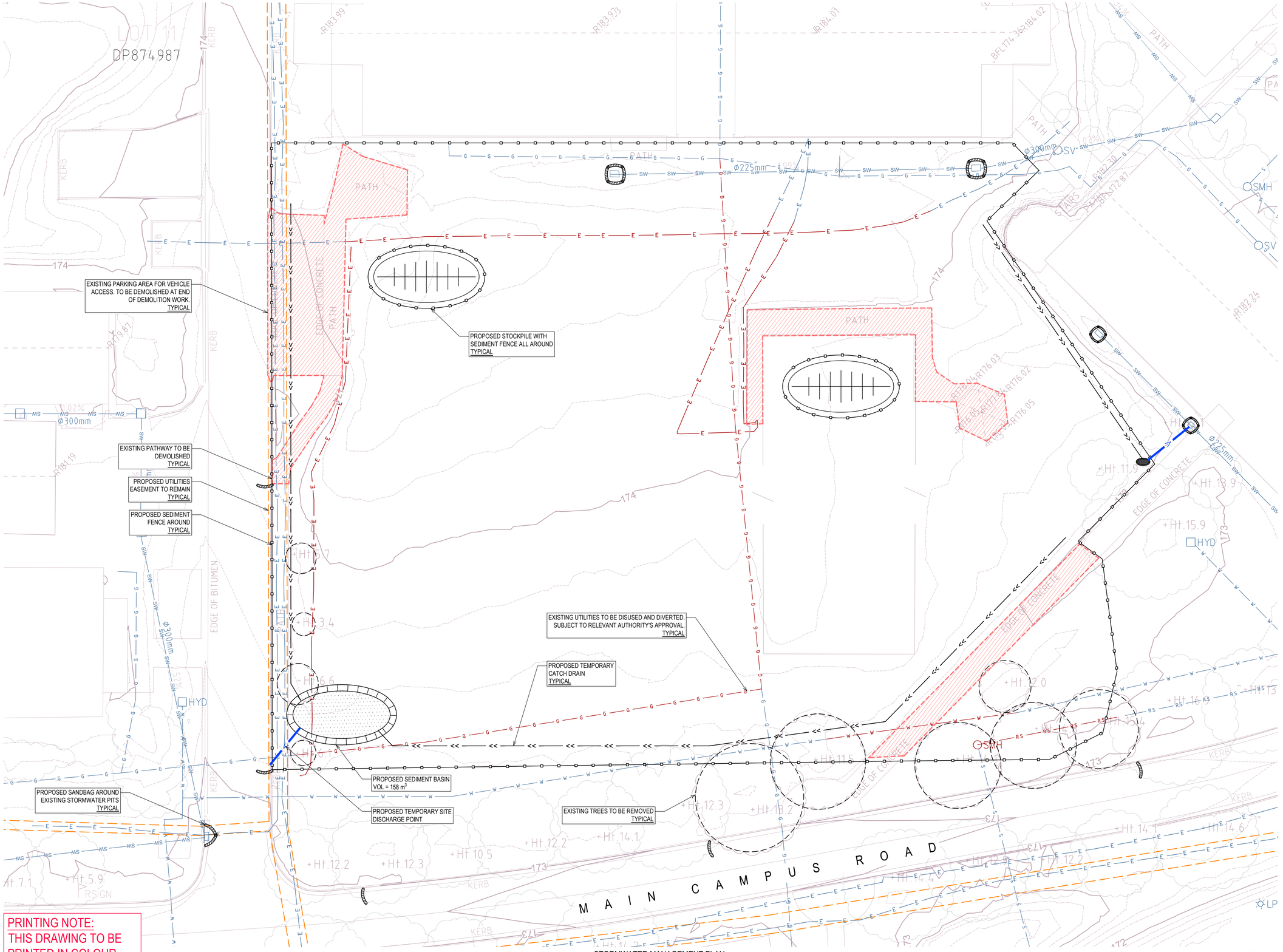
Building Services Consultants
ADP Consulting : Engineering
Melbourne Sydney Brisbane
www.adpconsulting.com.au adpconsulting@adpconsulting.com.au

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
CIVIL DRAINAGE DETAILS - SHEET 2

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024		@ A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE201	B	



LEGEND

- SITE BOUNDARY
- EASEMENT BOUNDARY AND EXTENT
- SEDIMENT FENCE
- EXISTING STRUCTURES TO BE DEMOLISHED
- EXTENT OF WORKS
- EXTENT OF PROPOSED BUILDING
- OVERLAND FLOW DIRECTION
- EXISTING ELECTRICAL LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING UTILITY LINE TO BE DIVERTED
- PROPOSED STOCKPILE LOCATION WITH SEDIMENT FENCE

RUSLE CALCULATION NOTE

REVISED UNIVERSAL SOIL LOSS EQUATION:
$A = R * K * Ls * P * C$ (t/Ha/yr)

$R = 164.74 (1.1177)^{S} * S^{0.6444}$
WHERE S = 14.1 mm/HR
R = 4352
Ls = 0.36 (BASED ON 2% SLOPE FOR 60 m)
K = 0.06 (ASSUMED)
C = 1.0
P = 1.3

A = 122 t/Ha/yr < 150 t/Ha/yr

HENCE, PER TABLE 3.1 OF "BEST PRACTICE EROSION & SEDIMENT CONTROL BOOK 1"
EROSION HAZARD = VERY LOW HAZARD

SEDIMENT BASIN CALCULATION

ASSUMED TYPE D BASIN

VOLUME OF SETTLING ZONE = 10 * R * CV * A
SEDIMENT STORAGE VOL = 50% SETTLING VOLUME

A = 0.4968 Ha
CV = 0.74 (TABLE F2)
$R_{75\%\text{-}5\text{-}DAY}$ = 28.6 (TABLE 6.3A)

SETTLING ZONE = 105 m^3
SEDIMENT STORAGE VOLUME = 53 m^3
SEDIMENT BASIN VOLUME = 158 m^3

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

STORMWATER MANAGEMENT PLAN
SCALE 1:200

A1 0 1 2 3 4 5 6 7 8 9 10 1:100

BEFORE YOU DIG www.byda.com.au

DEVELOPMENT APPLICATION

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

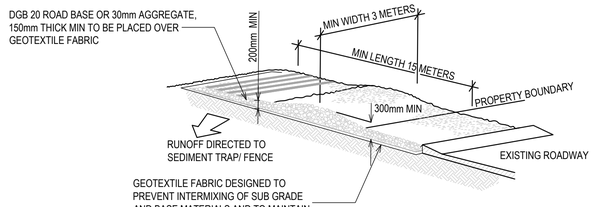
Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
SEDIMENT AND EROSION CONTROL PLAN

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC 2024	1:200	@ A1

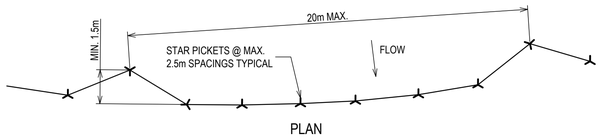
Job Number	Drawing Number	Revision	North Point
SYD2908	CE300	B	



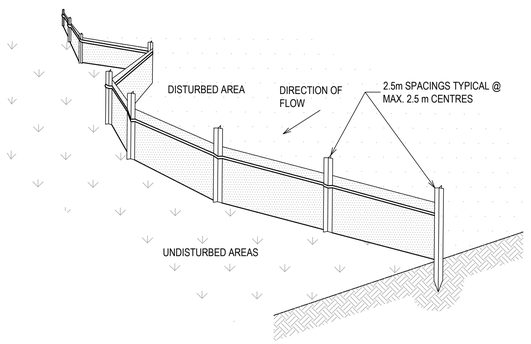
STABILISED SITE ACCESS WITH SHAKER RAMP

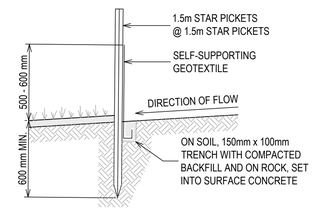
SCALE N.T.S.

NOTES:
1. THIS DEVICE IS TO BE LOCATED AT ALL EXITS FROM CONSTRUCTION SITE.
2. THIS DEVICE IS TO BE REGULARLY CLEANED OF DEPOSITED MATERIAL SO AS TO MAINTAIN A 50mm DEEP SPACE BETWEEN PLANKS.
3. ANY UNSEALED ROAD BETWEEN THIS DEVICE AND NEAREST ROADWAY IS TO BE TOPPED WITH 100mm THICK 40-70mm SIZE AGGREGATE.
4. ALTERNATIVELY, THREE(3) PRECAST CONCRETE CATTLE GRIDS (AS MANUFACTURED BY "HUMES CONCRETE MAY BE USED. 1, 2 & 3 ABOVE ALSO APPLY.



PLAN





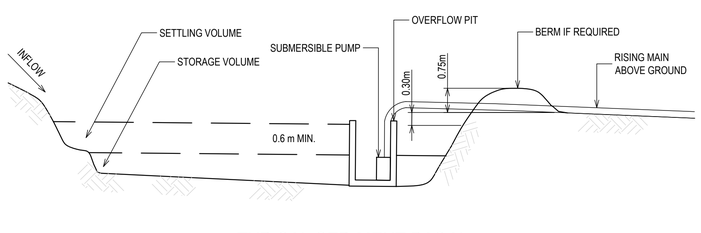
SECTION DETAIL

SEDIMENT FENCE

SCALE N.T.S.

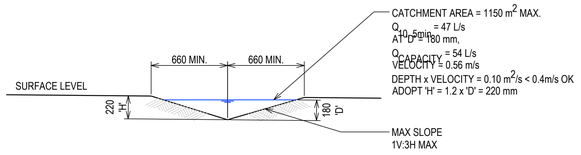
SEDIMENT FENCE CONSTRUCTION NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150 mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 m LONG STAR PICKETS INTO GROUND @ 2.5 m INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150 mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.



TYPICAL SEDIMENT BASIN

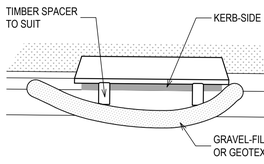
SCALE N.T.S.

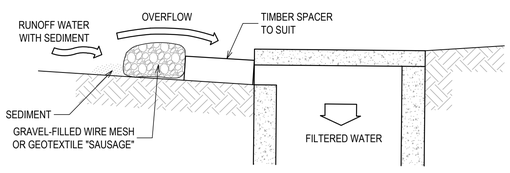


TYPICAL SECTION THROUGH CATCH DRAIN

GENERAL INSTRUCTIONS:

1. THIS SEDIMENT AND EROSION CONTROL WORKS FOR THE SITE SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION, 4TH EDITION (2004)" BY LANDCOM.
2. AS REQUIRED BY COUNCIL, SEDIMENT CONTROL MEASURES WILL BE REQUIRED DURING THE CONSTRUCTION OF ALL DEVELOPMENTS/BUILDING WORKS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY THAT THE WORKS ARE CARRIED OUT IN ACCORDANCE WITH THE SEDIMENT AND EROSION CONTROL PLAN AND COUNCIL'S REQUIREMENTS.
3. THE CONTRACTOR SHALL ENSURE THAT ALL SUBCONTRACTORS ARE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE AREAS.
4. THE NON-DISTURBED PORTION OF THE CATCHMENT OUTSIDE OF OPERATING AREA IS TO BYPASS THE BASINS BY MEANS OF LINED CATCH DRAINS.
5. WHERE PRACTICABLE, THE SOIL EROSION HAZARD SHALL BE KEPT AS LOW AS POSSIBLE. LIMITATIONS TO ACCESS ARE TO BE VIA STANLEY LANE UNLESS OTHERWISE APPROVED BY COUNCIL.
6. ENSURE THAT ALL DRAINS ARE OPERATING EFFECTIVELY AND SHALL MAKE ANY NECESSARY REPAIRS. REMOVE TRAPPED SEDIMENT WHERE THE CAPACITY OF THE TRAPPING DEVICE FALLS BELOW 60%.
7. CONSTRUCT ADDITIONAL EROSION OR SEDIMENT CONTROL WORKS AS MAY BE APPROPRIATE TO ENSURE THE PROTECTION OF DOWNSLOPE LANDS AND WATERWAYS.
8. MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES IN A FULLY FUNCTIONING CONDITION AT ALL TIMES UNTIL THE SITE IS REHABILITATED.
9. REMOVE TEMPORARY SOIL CONSERVATION STRUCTURES AS THE LAST ACTIVITY IN THE REHABILITATION PROGRAM.

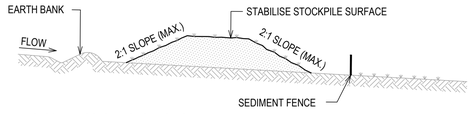




MESH & GRAVEL INLET FILTER CONSTRUCTION NOTES:
1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT / LADEN WATERS CANNOT PASS BETWEEN.

MESH & GRAVEL INLET FILTER

SCALE N.T.S.

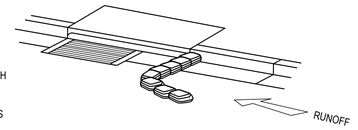


STOCKPILE CONSTRUCTION NOTES:
1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.

STOCKPILES

SCALE N.T.S.

NOTES:
1. PROVIDE THREE LAYERS OF SANDBAGS WITH THEIR ENDS OVERLAPPED AND ALSO OVERLAPPING ONTO THE KERB.
2. CREATE A GAP IN THE SANDBAGS TO ACT AS A SPILLWAY.
3. SANDBAG BARRIER TO BE MIN. 2m FROM THE INLET AND EXTEND MIN. 0.9m OUT FROM THE KERB.



GULLY INLET SANDBAG PROTECTION DETAIL

SCALE N.T.S.

CONSTRUCTION SEQUENCE:

WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:

1. INSTALL SEDIMENT FENCING AND CUT DRAINS TO MEET THE REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLAN. WASTE COLLECTION BINS SHALL BE INSTALLED ADJACENT TO SITE OFFICE.
2. CONSTRUCT STABILISED SITE ACCESS IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.
3. REDIRECT CLEAN WATER AROUND THE CONSTRUCTION SITE.
4. INSTALL SEDIMENT CONTROL PROTECTION MEASURES AT ALL NATURAL AND MAN-MADE DRAINAGE STRUCTURES. MAINTAIN UNTIL ALL THE DISTURBED AREAS ARE STABILISED.
5. CLEAR AND STRIP THE WORK AREAS. MINIMISE THE DAMAGE TO THE GRASS AND LOW GROUND COVER OF NON-DISTURBED AREAS.
6. ANY DISTURBED AREAS, OTHER THAN BUILDING PAD AREAS, SHALL IMMEDIATELY BE COVERED WITH SITE TOPSOIL WITHIN 7 DAYS OF CLEARING. BUILDING PAD AREAS SHALL BE COVERED WITH BITUMEN EMULSION AS SPECIFIED.
7. APPLY PERMANENT STABILISATION TO SITE (LANDSCAPING).

PRINTING NOTE:
THIS DRAWING TO BE PRINTED IN COLOUR.

A1 0 1 2 3 4 5 6 7 8 9 10 1:100

Revision	Description	Initial	Date
B	ISSUE FOR DEVELOPMENT APPLICATION	MH	18.12.2024
A	ISSUE FOR DEVELOPMENT APPLICATION	MH	12.12.2024

Client
TAFE NSW

Architect
EJE ARCHITECTURE
412 KING STREET, NEWCASTLE NSW 2300

Building Services Consultants
ADP Consulting : Engineering
Melbourne www.adpconsulting.com.au
Sydney adpconsulting@adpconsulting.com.au
Brisbane

Project
TAFE MULTI-TRADES HUB
61 SNEATHS ROAD
WOLLONGBAR NSW 2477

Drawing Title
CIVIL ENGINEERING SERVICES
SEDIMENT AND EROSION CONTROL DETAILS

DEVELOPMENT APPLICATION

Drafted	Designed	Approved	Date	Scale	Sheet Size
MH	MH	SS	DEC2024		@ A1

Job Number	Drawing Number	Revision	North Point
SYD2908	CE305	B	

APPENDIX B – SITE SURVEY INFORMATION

Removed due to file size.
Refer to Barnson Detailed Survey
40701 - L01-03/04/05 B

APPENDIX C – SITE ARCHITECTURAL PLAN

Removed due to file size.
Refer to EJE 1
Drawings 5223 011 0100 0105

ADP
Consulting : Engineering

—

Inspire a better world through influence and design.

Melbourne
Level 13, 55 Collins Street
Melbourne VIC 3000
T. +61 3 9521 1195

Adelaide
Level 4, 22 King William Street
Adelaide SA 5000
T. +61 3 9521 1195

Brisbane
Level 16, 15 Adelaide Street
Brisbane QLD 4000
T. +61 7 3088 4022

Gold Coast
Level 10, 12-14 Marine Parade
Southport, QLD 4215
T. +61 7 3088 4022

Sydney
Level 6, 33 Erskine Street
Sydney NSW 2000
T. +61 2 8203 5447

London
53-64 Chancery Ln
London WC2A 1QS
United Kingdom
T. +44 74 9478 5117

adpconsulting.com

EJE Integrity Innovation Inspiration

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

TAFE Wollongbar Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW

Prepared by EJE
January 2025
Ref: 15223

412 King Street
Newcastle NSW 2300
02 4929 2353
mail@eje.com.au
eje.com.au

TABLE OF CONTENTS

1. CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN 2

1.1 Working Site Hours 2
1.2 24 Hour Site Contacts 2
1.3 Management of Dust & Odour 2
1.4 Stormwater Control and Discharge 2
1.5 Controlling Sediment Leaving Site 3
1.6 Groundwater Management Plan 3
1.7 Control of External Lighting 3
1.8 Flora and Fauna 4
1.9 Community Consultation & Complaints Handling 4
1.10 Location of Existing Services 4
1.11 Construction Traffic and Pedestrian Management Plan 4
1.12 Noise and Vibration Management 5
1.13 Construction Waste Management 5
1.14 Unexpected Finds Protocol 5
1.15 Restoration of Damage to Public Assets 6
1.16 Construction Management Plan 7

1. CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

The new Multi-Trades Hub (MTH) at Wollongbar campus will provide state-of-the-art facilities for Carpentry, Cabinet Making, Plumbing, and Electrotechnology. Featuring advanced technology and flexible spaces, it is designed to support practical training and collaborative learning.

This development addresses the relocation of Cabinet Making from Casino, insufficient space for Electrotechnology, and aging Plumbing facilities. By consolidating Northern Rivers TAFE district operations at Wollongbar, the campus will be established as a key regional hub.

1.1 WORKING SITE HOURS

Mondays – Fridays: 7:00am – 6:00pm
Saturdays: 8:00am – 1:00pm
Sundays & Public Holidays: No Work

1.2 24 HOUR SITE CONTACTS

In order of priority:

1. Site Manager: To be advised when Head Contractor appointed.
2. Project Manager: To be advised when Head Contractor appointed.
3. Site Engineer: To be advised when Head Contractor appointed.

1.3 MANAGEMENT OF DUST & ODOUR

To control and limit the impact of dust and odours during construction works, the Head Contractor will heavily implement dust suppression during high risk activities. This will be completed through either of the following methods:

- Spraying hose by man.
- Water cart by vehicle.
- Sprinklers set up on timers.

In the event that dust and odours are aggravated and continue to create disturbance to site users and surrounding TAFE occupants, the respective site users will continue to control the dust and odour through the below methods. Any works that are contributing to this disturbance will cease until deemed satisfactory to continue.

Continuing methods to further assist with odours:

- Spraying areas with hose by man.
- Water cart by vehicle.
- Placing barriers over and around effected areas.

If the above impacts do take place, the Head Contractor will at all times endeavour to resolve the issue as timely as possible as the health and wellbeing of site users and surrounding occupants is paramount to all stakeholders.

For further information please refer to the Head Contractor's Project Management Plan.

1.4 STORMWATER CONTROL AND DISCHARGE

Upon site establishment the Head Contractor will heavily monitor all drainage entry and discharge points. All drains are to be immediately controlled with fabric and/or silt fences to filter water entering and exiting the site.

During construction works the Head Contractor will create 2 catchment areas for heavy inclement weather, one being on the lower side of site and the holding/treatment area at the water tank location. If flocking and water treatment is required to catchment areas this will be completed in accordance with the Head Contractor's water treatment policy found within the project management plan and pumped from site upon achieving the correct turbidity reading.

These measures will be continually reviewed via weekly environmental inspections in accordance with the Head Contractor's environmental management plan.

Please refer to the Soil & Water Management Plan for further information.

1.5 CONTROLLING SEDIMENT LEAVING SITE

The Head Contractor will heavily monitor the subcontractor's plant and machinery entering and leaving the construction site. When plant and machinery are leaving site with effected tyres, tracks and/or bodywork the following methods will be implemented:

- Cattle grids installed to site exits.
- Water/hose available to thoroughly clean.
- Street sweeper/cleaner available to clean any sediment taken onto the roadways.

Please refer to the Soil & Water Management Plan for further information.

1.6 GROUNDWATER MANAGEMENT PLAN

For all stormwater running into and exiting the construction site please refer to section 1.5.

To limit the likes of groundwater contamination during construction works the Head Contractor will enforce the following actions:

- Again, all drainage location to be covered with fabric and silt controls.
- All plant and machinery to be thoroughly inspected upon arrival to site to ensure the equipment does not have any leaking fluids or the like.
- Enforce daily plant inspections by the subcontractor completed within their pre-starts.
- In the case of any spills of hazardous material the area is to be isolated and cleaned up in accordance with the Head Contractor's project management plan (environmental section).
- Works to be completed within contained areas barricaded from surrounding areas.

All subcontractors will be liable to maintain compliance with all of the Head Contractor's policies.

1.7 CONTROL OF EXTERNAL LIGHTING

The Head Contractor at all times will only be operating within the specified site hour day and times and in the instance external lighting is required which may affect the surrounding occupants and/or buildings the following measures will be closely monitored:

- External lights to be faced towards the site.
- In instances lighting will face beyond the site, the Head Contractor to submit a Notice of Disruption to the client for approval and comment.
- Include sufficient height fencing to limit lighting impact.

1.8 FLORA AND FAUNA

An Arborist Report and Koala Impact Assessment Report have been prepared by qualified ecologists and arborists and will be included in the Development Application as a required condition for Development Approval. Any flora and fauna mitigation measures outlined in these documents will be implemented throughout construction of the project.

1.9 COMMUNITY CONSULTATION & COMPLAINTS HANDLING

1.9.1 Training

Prior to the commencement of project activities, all site personnel (including subcontractors) will attend a site induction. This will include an outline of the requirements of this EMP and the responsibilities and accountabilities of all site personnel.

The project environmental site rules will be included in the induction session.

Training records will be kept to verify who has attended the training. Refer Site Inductions Section 3.5 of PMP.

1.9.2 Community Consultation

The Supervisor shall conduct and encourage the Head Contractor's employees and subcontractors to conduct toolbox meetings to address safety and environmental hazards in and around the site, community interactions and feedback, company alerts, Client raised environmental issues, safe work practices, coordination and responsibilities.

The Project Manager will advise relevant residents of the nature and scope of works.

1.9.3 Community Complaints

Upon receiving a community complaint, site personnel are to complete Form 18.5 Community Feedback.

Remedial action must be taken as soon as practical. Note, it is an objective to have all complaints actioned within 24 hours. Any action taken must be recorded on the form.

The Supervisor is to include the completed Form 18.5 in the site files.

All complaints are to be discussed and reviewed with the clients representative as soon as possible. Refer to the PMP for further information regarding complaints and consultation.

1.10 LOCATION OF EXISTING SERVICES

A subterranean services location search has been carried out to inform construction contractors as to where existing services may be located. The Head Contractor will carry out pot-holing where the location of services is in doubt to ensure the safety of site users and the continuation of services to the campus and local buildings.

1.11 CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN

Upon all subcontractor and site visitor inductions the current site construction traffic and pedestrian management plan will be discussed in detail. The plan will provide all required information for the below items:

- Location of works.
- Haulage and vehicle routes.
- Working hours.
- Access and control measures.
- Delivery areas, site entry and exits, etc.

- Construction parking locations.
- Any applicable impacts to traffic and pedestrians.
- Mitigation measures.

Refer to the project management plan for further information.

1.12 NOISE AND VIBRATION MANAGEMENT

Before works commence on site the Head Contractor will have an acoustic consultant prepare a noise and vibration management plan that will essentially be discussed with all site user inductions notifying all site users of the Head Contractor's requirements.

Upon completing the noise and vibration management plan the Head Contractor will then have the respective noise and vibration monitors installed for the construction works in accordance with the completed noise and vibration management plan.

The noise and vibration thresholds will be closely managed by the site personnel and the following control methods will be utilised:

- Noise and vibration monitors installed for high risk activities.
- Monitors linked to site staff phones for live readings if thresholds are breached.
- If breaches take place the Head Contractor site staff to implement further controls.
- Upon completion of high risk activities continue to measure levels to determine monitor requirements.

1.13 CONSTRUCTION WASTE MANAGEMENT

The Head Contractor is to achieve a minimum of 80% recycled waste throughout the construction works which will be done so via the following methodology:

- Include construction waste plan and targets in all inductions.
- Separate waste via allocated bins (including signage) throughout site i.e. steel, concrete, masonry, gyprock, mixed waste etc.
- Maintain all waste reports, dockets and supporting information.
- Waste contractor to provide monthly report as to what percentage of waste is being recycled.
- Return all over ordering to suppliers.

All supporting information is to be held within the Head Contractor's site office and available for viewing upon request.

Regarding soil wastage, the Head Contractor will dispose of all soil waste in accordance with the NSW EPA waste classification guidelines. Again, all soil that is removed from site will be recorded and documents will be held within the site office.

Further waste management policies and protocols can be viewed within the project management plan.

1.14 UNEXPECTED FINDS PROTOCOL

1.14.1 Asbestos & Contaminated Materials

In the instance that either asbestos or contaminated materials are encountered the Head Contractor will comply with all relevant Workcover and Safework guidelines.

The following methodology is to be followed at all times:

- Demolition and Earthworks subcontractors to have approved asbestos management plans which are to be followed immediately.
- The affected area is to be barricaded and isolated immediately.
- If the material is deemed to be asbestos, air monitors to be installed immediately.

- A qualified Geotechnical expert is to attend site to gather samples for testing.
- Notify Workcover for asbestos removal permit.
- Licensed asbestos removalists to remove asbestos and/or contaminated materials in accordance with respective guidelines.
- Coordinate disposal with waste company.
- A qualified Geotechnical expert to attend site and issue clearance certificate.
- Removal of air monitors.

1.14.2 Aboriginal and Non-Aboriginal Heritage

The Head Contractor ensures that if any items of anthropological and archaeological interest are uncovered during the course of the works, works will cease immediately in the area and the Principal is to be notified.

In the event of an item of Aboriginal heritage significance being uncovered during the works, works will cease in the vicinity of the find and both the Principal and Office of Environment and Heritage (OEH) is to be contacted immediately. Works will not recommence until an investigation has been completed by a suitably qualified person in accordance with OEH guidelines. If suspected human remains are identified during the works, works must immediately cease. The area must be secured and the NSW Police, the Principal and OEH notified immediately.

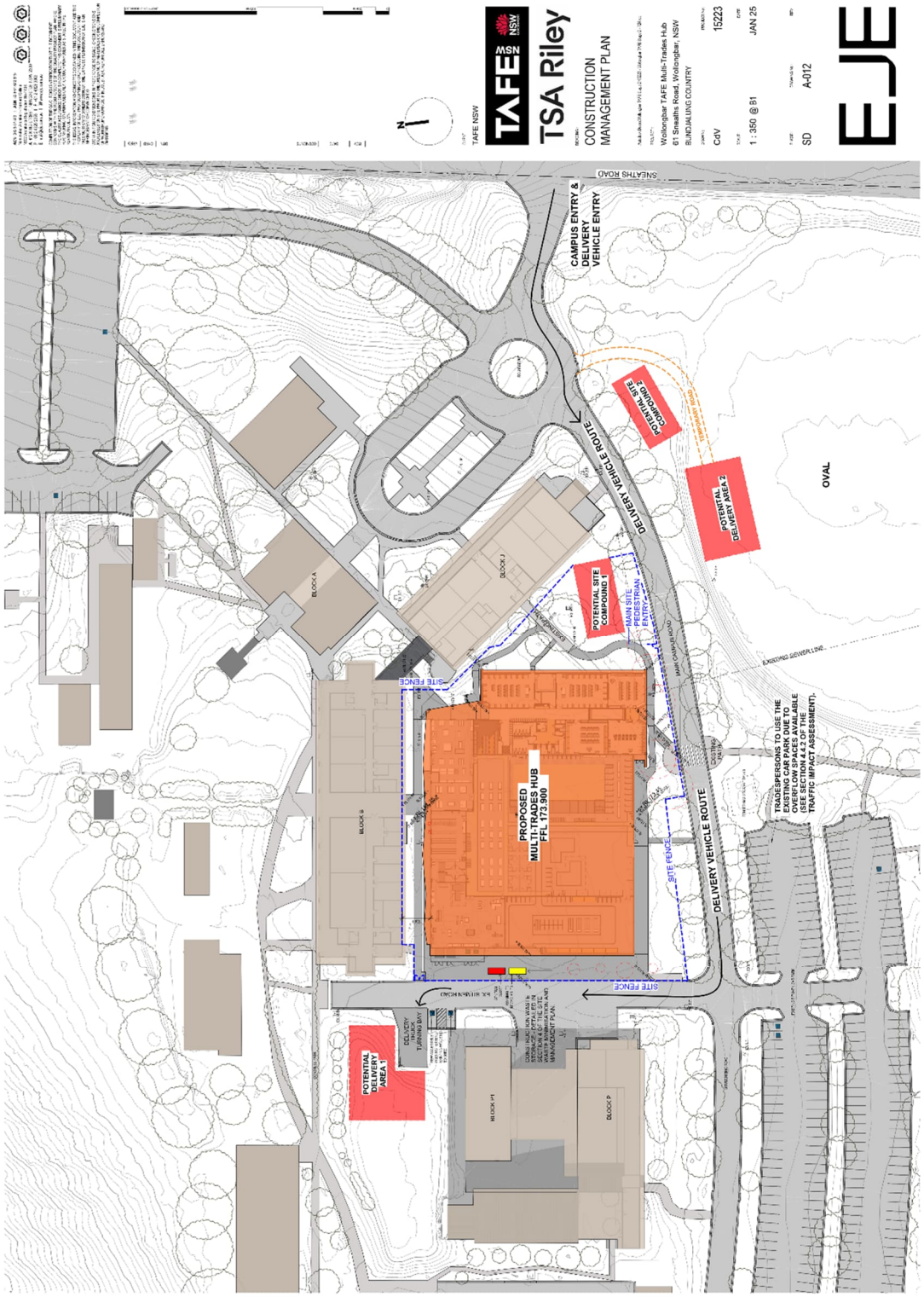
Contractors undertaking sub surface disturbance works associated with the proposed development are to review the specific Cultural Heritage Awareness Induction document prior to commencement of works.

1.15 RESTORATION OF DAMAGE TO PUBLIC ASSETS

Construction works and construction traffic will be limited to the hours of work detailed in Section 1.1. Any buildings or public assets deemed potentially structurally vulnerable to vibration will be subject to a pre and post construction dilapidation survey. If any complaints are received regarding construction traffic causing structural damage to buildings or public assets, dilapidation surveys will be undertaken immediately and again post construction to determine impacts (if any) and any restoration required.

1.16 CONSTRUCTION MANAGEMENT PLAN

Please note that this plan shows the potential location of site fences, site compounds and delivery areas. These locations will be confirmed by the Head Contractor when engaged.



ENVIRONMENTAL CONSULTING Pty Ltd

SITE WASTE MINIMISATION AND MANAGEMENT PLAN

WOLLONGBAR TAFE – PROPOSED MULTI-TRADES HUB

January 2025

Prepared For: TAFE NSW

Lot 10 DP 874987
61 Sneaths Road
Wollongbar NSW

HMC2024.1088

RE: Lot 10 DP 874987, 61 Sneaths Road Wollongbar NSW.

HMC Environmental Consulting Pty Ltd is pleased to present our Site Waste Minimisation and Management Plan for the abovementioned development. We trust this report meets with your requirements. If you require further information, please contact HMC Environmental Consulting directly on the numbers provided.

HMC Environmental Consulting
Suite 29, Level 2, 75-77 Wharf Street
PO Box 311
Tweed Heads NSW 2485

PH: 0755368863
Email: admin@hmcenvironment.com.au
Web: www.hmcenvironment.com.au
ABN: 60 108 085 614

Title:	Site Waste Minimisation and Management Plan
Job No:	2024.1088
Client:	TAFE NSW c-/ EJE Architecture

Document Record:

Version	Date	Prepared by	Checked by	Approved for issue by
Draft Issue A	17.01.2025	MF	MT	KH
Final Issue A	30.01.2025	MF		SV

Distribution List	Date	Version	Comments
EJE Architecture	17.01.2025	Draft Issue A	For review
EJE Architecture	30.01.2025	Final Issue A	For lodgement

This report should be cited as '*HMC Environmental Consulting (2025). Site Waste Minimisation and Management Plan, Proposed Wollongbar TAFE Multi-Trades Hub, Lot 10 DP 874987, 61 Sneaths Road Wollongbar NSW. Report No. HMC2024.1088.*'

COPYRIGHT
© HMC Environmental Consulting Pty Ltd, 2025
All intellectual property and copyright reserved.
Apart from any fair dealing for the purpose of private study, research, criticism, or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system, or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission. Enquiries should be addressed to HMC Environmental Consulting Pty Ltd.

TABLE OF CONTENTS

1 INTRODUCTION 5
1.1 Project Description 5
1.2 Aim 5
1.3 Objectives 6
2 STATUTES AND POLICY 6
2.1 Relevant Legislation & Guidelines 6
3 WASTE GENERATION 7
3.1 Demolition Stage 7
3.2 Construction Stage 7
3.3 Occupation Stage 8
4 WASTE STORAGE REQUIREMENTS 9
4.1 Demolition Stage 9
4.2 Construction Stage 9
4.3 Occupation Stage 9
5 BIN IDENTIFICATION AND SIGNAGE 10
5.1 Signage 10
6 EDUCATION & EVALUATION 10
6.1 Information & Awareness 10
7 REVIEW & MONITORING 11
7.1 Monitoring of Waste Management 11
7.1.1 Construction 11
7.1.2 Occupation 11
7.2 Review of SWMMP 11
8 RECOMMENDATIONS 12
9 CONCLUSION 12
10 LIMITATIONS 13
11 SIGNATURE 13
12 APPENDICES 13
APPENDIX 1 - LOCATION MAPS 14
APPENDIX 2 - SITE PLAN PROPOSED DEVELOPMENT 17
APPENDIX 3 - TEMPORARY WASTE STORAGE AREA - DEMOLITION 19
APPENDIX 4 - TEMPORARY WASTE STORAGE AREA - CONSTRUCTION 20
APPENDIX 5 - WASTE STORAGE AREA - OCCUPATION 22
APPENDIX 6 - TYPICAL BIN SIZES 24
APPENDIX 7 - PROSKIPS CONSTRUCTION RESOURCE RECOVERY 27

LIST OF TABLES

Table 1 Project Summary 5
Table 2 Environmental Legislation and Policy Specific to Waste Management 6
Table 3 Estimated Waste Generation – Construction 8
Table 4 Recommended Waste Storage Bins - Construction 9
Table 5 Summary of Waste Management Recommendations 12

KEY CONTACTS

Company/Name	Contact Details	Phone Number/contacts	Available:
HMC Environmental Consulting	Mark Tunks	0408 279212	Business Hours
Ballina Shire Council	Council Offices	1300 864444 After hours emergency 0266 266954	Mon- Fri 8.15am -4.30pm
Ballina Waste Management Centre	Weighbridge 167 Southern Cross Drive Ballina	02 66861287	8am-4pm 7 days (excluding PH)
Richmond Waste	Tony Martin	(02) 6621 7431	Mon-Fri 9am-5pm
Project Manager	TBA	TBA	TBA
Maintenance Manager	TBA	TBA	TBA

ENVIRONMENTAL EMERGENCY RESPONSE CONTACTS

Organisation	Incident	Contact
Ambulance	Injury/Illness	000 land line 112 mobile
Fire Brigade – Emergencies	Fire Chemical/hazardous waste spill	000
NSW Environment Protection Agency	Pollution	1300 130 372
Ballina Shire Council	Pollution (Environmental Health)	02 66861 210 8.15am-4.30pm Monday-Friday 1300 864444

Abbreviations

ACM	Asbestos containing material
BSC	Ballina Shire Council
EPA	NSW Environmental Protection Authority
HMC	HMC Environmental Consulting Pty Ltd
MGB	Mobile Garbage Bin
OEH	NSW Office of Environment & Heritage
Site	Lot 10 DP 874987, 61 Sneaths Road Wollongbar NSW
SMF	Synthetic Mineral Fibres
SWMMP	Site Waste Minimisation and Management Plan
TBA	To be advised
Proponent	TAFE NSW c-/EJE Architecture
Guidelines:	
BDCP 2012	*Chapter 2 General and Environmental Considerations Ballina Development Control Plans 2012*
NSW EPA, 2012	*Better Practice Guidelines for Waste Management in Commercial and Industrial Facilities*

1 INTRODUCTION

HMC Environmental Consulting (HMC) has been engaged by EJE Architecture on behalf of the proponent, TAFE NSW, to provide a Site Waste Minimisation and Management Plan (SWMMP) for a development application for a proposed Multi-Trades Hub at Wollongbar TAFE, located at Lot 10 DP 874987, 61 Sneaths Road Wollongbar NSW. The development involves the construction of a new Multi-Trades Hub building within the existing campus, along with associated services and landscaping. The proposed development area is currently largely vacant, with only minor demolition proposed including the disused tennis court and rotunda, along with small sections of pathways and carparking.

The SWMMP is to be used to assist in the management of waste storage and collection for the purpose of maximising reuse/recycling, improving the services and safety of the contractors, improving the amenity of the area, and to reduce costs of waste management.

1.1 PROJECT DESCRIPTION

Table 1 Project Summary

Address	61 Sneaths Road Wollongbar NSW
Property Description	Lot 10 DP 874987
Existing buildings and other structures currently on the site	Wollongbar TAFE
Description of proposed development	Construction of a new Multi-Trades Hub building within the existing Wollongbar TAFE campus, along with associated services and landscaping. Waste would be generated during the demolition, construction, and operational stages of the development. The location of the site, its topographic features and relationship with adjoining development is shown on the map and aerial photograph in Appendix 1.
This development achieves the waste objectives set out in C2 Ballina DCP 2012. The details on this form are the provisions and intentions for minimising waste relating to this project. All records demonstrating lawful disposal of waste will be retained and kept readily accessible for inspection by regulatory authorities such as BSC, NSW EPA or Safework NSW.	

1.2 AIM

The principal aim of managing this activity is to maximise resource recovery and minimise residual waste from demolition, construction and operation activities associated with the proposed Wollongbar TAFE Multi-Trades Hub and facilitate effective ongoing waste management practices consistent with the principles of Ecologically Sustainable Development (ESD).

1.3 OBJECTIVES

1. To maximise resource recovery and minimise residual waste
2. To maximise reuse and recycling of materials
3. To minimise waste generation
4. To ensure appropriate storage and collection of waste
5. To minimise the environmental impacts associated with waste management
6. To avoid illegal dumping
7. To promote improved project management.

2 STATUTES AND POLICY

2.1 RELEVANT LEGISLATION & GUIDELINES

Table 2 Environmental Legislation and Policy Specific to Waste Management

Legislation	Details	Approvals/Permits Required
Waste Avoidance and Resource Recovery Act 2001	Repeals the Waste Minimisation and Management Act and replaces a target of 60% reduction in waste to landfill with a process for the preparation of waste strategies which identify more specific targets and objectives for waste reduction.	Compliance must be achieved in relation to waste management during construction. Permits may be required for offsite disposal of hazardous or contaminated material.
Contaminated Land Management Act 1997	Provides for the investigation and remediation of contaminated land.	Specific approvals are not required however, construction works must comply.
Environmentally Hazardous Chemicals Act 1985	Provides for the control of the effect on the environment of chemicals and chemical waste. Scheduled chemicals would not be used in the proposed development.	
Protection of the Environment Operations Act 1997	This Act is the primary NSW environment protection legislation that covers air, noise, water, land, and waste management. It provides a framework to regulate and enforce pollution control in NSW. The Act identifies mechanisms for preventing environmental degradation including, pollution prevention, cleaner production, reduction in discharge levels likely to cause harm to the environment, recycling, and progressive environmental improvement. The proposed development would adhere to the requirements of this legislation.	
Protection of the Environment Operations (Waste) Regulation 2014	The Waste Regulation 2014 provides for contributions to be paid by occupiers of scheduled waste facilities for each tonne of waste received at the facility or generated in a particular area; exempts certain occupiers or types of waste from these contributions; and allows deductions to be claimed in relation to certain types of waste. It sets out provisions covering: ● record-keeping requirements, measurement of waste and monitoring for waste facilities ● tracking of certain waste ● reporting ● transportation of waste ● transportation and management of asbestos waste ● recycling of consumer packaging	

	• classification of waste containing immobilised contaminants • miscellaneous topics.
Ballina Shire Council Development Control Plan Chapter 2 2012	Identifies requirement for Site Waste and Minimisation Management Plan and the information to be provided within the SWMMP regarding waste storage and collection facilities and controls. Appendix B within Chapter 2 describes waste generation rates. This SWMMP has been prepared to meet the objectives of this DCP.
NSW Environment Protection Authority *Better Practice Guide for Waste Management and Recycling in Commercial and Industrial Facilities 2012*	Identifies installation and maintenance practices for services and infrastructure for waste handling and collection systems. The systems are aiming to achieve the best possible waste minimisation and resource recovery outcome. The waste management systems identified include effective, efficient, and safe systems for both their ease of use by residents and their ability to be serviced by collection crews.
Construction and Demolition Waste Guide – Recycling and Reuse Across the Supply Chain Department of Sustainability, Environment, Water Population and Communities 2011	The aim of this guide is to help develop effective markets for materials diverted or derived from the construction and demolition waste stream.

3 WASTE GENERATION

3.1 DEMOLITION STAGE

The development area is largely vacant with only minimal demolition required. There is fencing and paving associated with a disused tennis court, as well as a timber rotunda (approximately 30m^2) which will demolished. Additionally, small sections of existing pathways, as well as a car parking area would also be removed prior to the construction commencing.

Services (if any) would be disconnected including power, and town water.

Demolition would occur over a short period of time (1 week) to allow subsequent installation of erosion and sediment control prior to site stripping and earthworks for the proposed development.

Separation of masonry, brick, concrete from other recyclables is encouraged, with significant savings on resource recovery costs.

Metal, including copper pipe, is also a profitable waste stream with recyclers providing significant returns. The following waste generation volumes have been estimated based on approximate calculations using floor areas and similar demolition sites.

Given the limited amount of demolition required, direct loading into transport vehicles is likely, with any remaining materials incorporated into the construction waste servicing.

3.2 CONSTRUCTION STAGE

The development involves the construction of a new Multi-Trades Hub building within the existing campus, along with associated services and landscaping. The proposed development area is currently vacant; therefore, no demolition is proposed. Minor site stripping will be required.

Waste generating activities during construction would comprise:

- Site stripping.

- Earthworks including footings and services.
- Construction of the Multi-Trades Hub structure, including building shells, fitouts, carparking and landscaping.

The following typical waste generation figures have been provided based on similar construction sites. As discussed in the previous section, resource recovery centres indicate that 80-90% by volume (95% by weight) of construction waste is able to be recycled (see Table 3).

Table 3 Estimated Waste Generation – Construction

Type of Waste	Reuse *Estimated Volume or Weight*	Recycling *Estimated Volume or Weight*	Disposal *Estimated Volume or Weight*	Method of Reuse/Recycling or Waste Depot
Excavated Material	<100m^3	-	<200m^3	Waste classification of excavated material in accordance with the NSW EPA Waste Classification Guidelines would be required prior to removal off-site.
Timber Concrete Bricks/pavers Tiles Metal Glass Furniture Fixtures/fittings Floor coverings	Limited on construction sites.	80-90% construction and demolition waste recycled by resource recovery centres	10-20% Including site office general waste and packaging & debris/offcuts that cannot be recycled	• Lismore Recycling and Recovery Centre • Richmond Waste • Second-hand building material contractors
Packaging Green waste organics Containers (cans/glass/plastic) Paper/cardboard Residual waste		<100m^3	<40m^3	80-90% recycled/reused: Lismore Recycling and Recovery Centre

3.3 OCCUPATION STAGE

Waste generating activities during operation would comprise:

- Operation of the proposed Multi-Trades Hub.

There are no estimated waste generation rates for the proposed use of the structure within the BSC DCP 2012 or the NSW EPA guidelines, therefore site-specific information was provided by the proponent with knowledge of existing and similar operations.

The Wollongbar TAFE currently includes facilities for Carpentry, Electrotechnology and Plumbing which will all be incorporated into the new proposed Multi-Trades Hub. The new Hub will also include Cabinet Making facilities, relocating from the Casino TAFE campus, therefore increasing the recyclable timber waste by approximately 30%. The proponents have indicated that the proposed development is not expected to increase other existing waste streams and could, therefore, be incorporated into the existing waste management system, while accounting for the increase in recyclable timber.

The waste is currently sorted into general waste, recyclables and paper/carboard, with a communal waste management system for the entire campus.

4 WASTE STORAGE REQUIREMENTS

The following design storage volume recommendations have been based on the waste generation rates as detailed in the previous section and are provided to establish site suitability.

Adequate space is available within the site for the storage of waste during the construction, and operation stages. Refer to site plans in Appendices 3, 4 & 5.

4.1 DEMOLITION STAGE

During the demolition stage, the site would be secured with safety fencing and demolition waste would be placed into waste streams in designated skip bins or transport vehicles for transport to the resource recovery centre. The waste streams would include:

- Co-mingled waste
- General waste
- Heavy recyclables (concrete and masonry)

Given the limited demolition required, direct loading into transport vehicles is likely to occur, with all remaining materials incorporated into the construction waste receptacles. Refer to site plan in Appendix 3.

4.2 CONSTRUCTION STAGE

Adequate space is available on site to provide temporary waste storage and recyclable building waste storage during construction stage of the development. Refer to site plan in Appendix 4.

Table 4 Recommended Waste Storage Bins - Construction

Waste Type	Required Service	Proposed Industrial Bin Size at Collection Point
Recycling & General Waste Service	• 1 x 10m^3 skip bin for general waste (includes site office) • 1 x 10m^3 skip bin for co-mingled building waste to be sorted at facility	• 1 x 10m^3 skip bin serviced on demand for general waste. • 1 x 10m^3 skip bin serviced on demand for co-mingled building waste

4.3 OCCUPATION STAGE

Dedicated waste receptacles would be located throughout the structure with all waste sorted within the structure, and transported to the waste storage area.

It is anticipated that the current waste management storage and servicing for the Wollongbar TAFE would be sufficient to manage the estimated waste generation for the proposed Multi-Trades Hub as stated by the proponent. Existing facilities will be relocated and incorporated into the new Hub, with only minor additional trade facilities, including Cabinet Making, to be introduced to the Wollongbar Campus. The expected additional waste, including recyclable timber, would be managed through additional recycling procedures outside of the existing waste management system and receptacles. It is recommended that the waste management system be monitored in the initial stages to ensure that sufficient storage and servicing is available to manage the waste generated. Should waste generation in any waste stream exceed estimates, sufficient space and opportunities is available to increase receptacles and servicing if required.

Currently, the waste bins are stored ad hoc around the campus in open storage areas. Information about the existing bins and servicing was obtained by the proponents. Currently, bulk bins are existing to service the trades hub for both **General Waste** and **Cardboard/Paper**. 4 x 3m^3 bulk bin is weekly for General Waste, while 2 x 3m^3 bulk bin is serviced monthly for Cardboard/Paper. All green waste from landscaping maintenance is reused onsite through mulching or removed and disposed of by service contractors. There currently is no organics collection and servicing, with any additional organics, including food waste, included in the general waste servicing. Increased servicing of Cardboard/Paper, and the introduction of Co-Mingled Recyclable waste servicing could reduce the amount of general waste to landfill. Additional programs on the campus including the collection of bottles and cans for a Return and Earn program, as well as the collection of food waste for onsite composting would also further decrease the amount of general waste serviced. However, these are out of the scope of the proposed Multi-Trades Hub development.

Specific waste streams are generated from the existing trades facilities which would be incorporated into the proposed Multi-Trades Hub. Approximately 2 tonnes of **Scrap Metal** is produced annually which is currently collected by metal recyclers. **Waste Oil** is currently serviced on demand by private contractors, with less than 20L produced annually. **Recyclable Timber** waste is collected and disposed of through private contract. It is expected that introduction of cabinet making to the campus will result in a 30% increase in recyclable timber waste, which will be incorporated into the currently arrangement, with increased servicing where required.

The proponents have advised that the current arrangement is sufficient for servicing all generated waste and is expected to be sufficient for the minor increase in generated waste as a result of the proposed expansion.

A dedicated waste storage area has been included in the proposed development plans, to be located adjacent to the northwestern corner of the proposed structure. The area will house 2 x 3m^3 bulk bins (General Waste and Paper/Cardboard). The area has been sized so that additional bins can be housed within the yard, if required. The services yard will be constructed in accordance with the Ballina Shire DCP 2012. Nominated staff or maintenance personnel will transport the waste from the proposed services yard to the nominated collection area to the northwest adjacent to the existing internal roadway. The bins are serviced onsite via a waste contractor (Richmond Waste) driving on site to the storage areas located across the campus with the truck traversing in a forward motion and entering and existing the site from Sneaths Road to the east. The storage areas are monitored via the maintenance person or other person nominated by the TAFE. Refer to site plan in Appendix 5.

5 BIN IDENTIFICATION AND SIGNAGE

5.1 SIGNAGE

All bins, collection facilities will be clearly marked with labels, colour coding, symbols, and words. Signs will be highly visible. The signage would clearly describe the type of materials that can be deposited into each bin.

Signage should be consistent with those used at garbage storage areas.

6 EDUCATION & EVALUATION

6.1 INFORMATION & AWARENESS

It is good practice for all sub-contractors, project staff, TAFE management, staff, students and visitors to be made aware of the aims and benefits of the waste minimisation program to encourage maximum participation.

During construction, the induction would include information on waste streams, waste storage receptacles and recycling.

Several strategies will be used to avoid mistakes when separating waste and recyclables and make sure bins and equipment are used correctly. These include:

- using clear signage with consistent design and colours in waste storage rooms and on bins (standard signage)
- ensuring the appointment of a waste supervisor responsible for the proper separation of waste, waste storage area and collection. The waste supervisor is to be also responsible for having the receptacles out for collection at the nominated collection point.

7 REVIEW & MONITORING

7.1 MONITORING OF WASTE MANAGEMENT

Waste monitoring is necessary to assess whether the strategies implemented have been effective in achieving the SWMMP's aims.

7.1.1 Construction

Monitoring would be carried out on a weekly basis by the project Site Manager during construction.

The monitoring process would include:

- Site Manager to oversee waste collection activities to assess compliance with SWMMP.
- Waste volume monitoring carried out by the waste contractor during collection and servicing procedures.

7.1.2 Occupation

Ongoing regular monitoring would be undertaken by the waste supervisor, staff, and waste contractors.

7.2 REVIEW OF SWMMP

This SWMMP will be reviewed and updated, if necessary, using the results of monitoring of the waste volume and type being generated during the development stages.

The review will also address and reflect:

- changes in the development management process.
- changes in design or sequence of development staging.
- changes in access to the Project Site.
- changes or requests directed by local or state authorities i.e., Ballina Shire Council, State Government Departments.
- changes in the environment.
- changes in generally accepted environmental management practices.
- changes in legislation.
- new risks to the environment or public health.
- any pollution or contamination events.

8 RECOMMENDATIONS

The waste storage and servicing recommendations, as detailed in this report, are summarised below:

Table 5 Summary of Waste Management Recommendations

Project Stage	Activity	Waste Storage/Servicing
Demolition & Construction	Building Servicing/trenching Waste offcuts, packaging, excess materials, Site office	• 1 x 10m^3 skip bin serviced on demand for general waste. • 1 x 10m^3 skip bin serviced on demand for co-mingled building waste.
Occupation	Proposed Multi-Trades Hub	Minimal additional waste generation is to be collected and serviced within the existing waste storage and servicing arrangement for the Wollongbar TAFE, which includes: • 4 x 3m^3 bulk bins for general waste, serviced weekly • 2 x 3m^3 bulk bin for carboard/paper waste, serviced monthly • Collection of scrap metal, recyclable timber and waste oil by private contract and metal recyclers. • Green waste reused onsite via mulching, or removed from site by service contractors.

9 CONCLUSION

A review of the plans shows there is adequate area available on the site to provide suitable storage facilities for waste generated during the proposed demolition, construction and occupation of the Wollongbar TAFE Multi-Trades Hub.

Tables 3-4 and Sections 4 & 5 of this report demonstrate that the expected waste storage and collection service is generally compliant with the waste storage volumes estimates within the *Chapter 2 General and Environmental Considerations Ballina Development Control Plans 2012* (BDCP, 2012). Close monitoring of the waste levels is required to ensure that the servicing is adequate, with ample opportunities to increase the bin sizes and servicing frequency available via private waste contractors.

The proposed waste management arrangements within this report are considered adequate for the purposes of the demolition, construction and occupation associated with the proposed Wollongbar TAFE Multi-Trades Hub to be located at Lot 10 DP 874987, 61 Sneaths Road Wollongbar NSW.

10 LIMITATIONS

The information within this document is and shall remain the property of HMC Environmental Consulting Pty Ltd.

This document was prepared for the sole use of client and the regulatory agencies that are directly involved in this project, the only intended beneficiaries of our work. No other party should rely on the information contained herein without the prior written consent of HMC Environmental Pty Ltd and client.

Your report is based on the assumption that the site conditions as revealed are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary.

11 SIGNATURE

This report has been prepared by Mark Tunks, Principal of HMC Environmental Consulting Pty. Ltd. Note that HMC Environmental Consulting holds current Professional Indemnity Insurance to 4th August 2025.

Mark Tunks
Principal

17 January 2025
Completion Date

12 APPENDICES

See following pages.

APPENDIX 1 - LOCATION MAPS

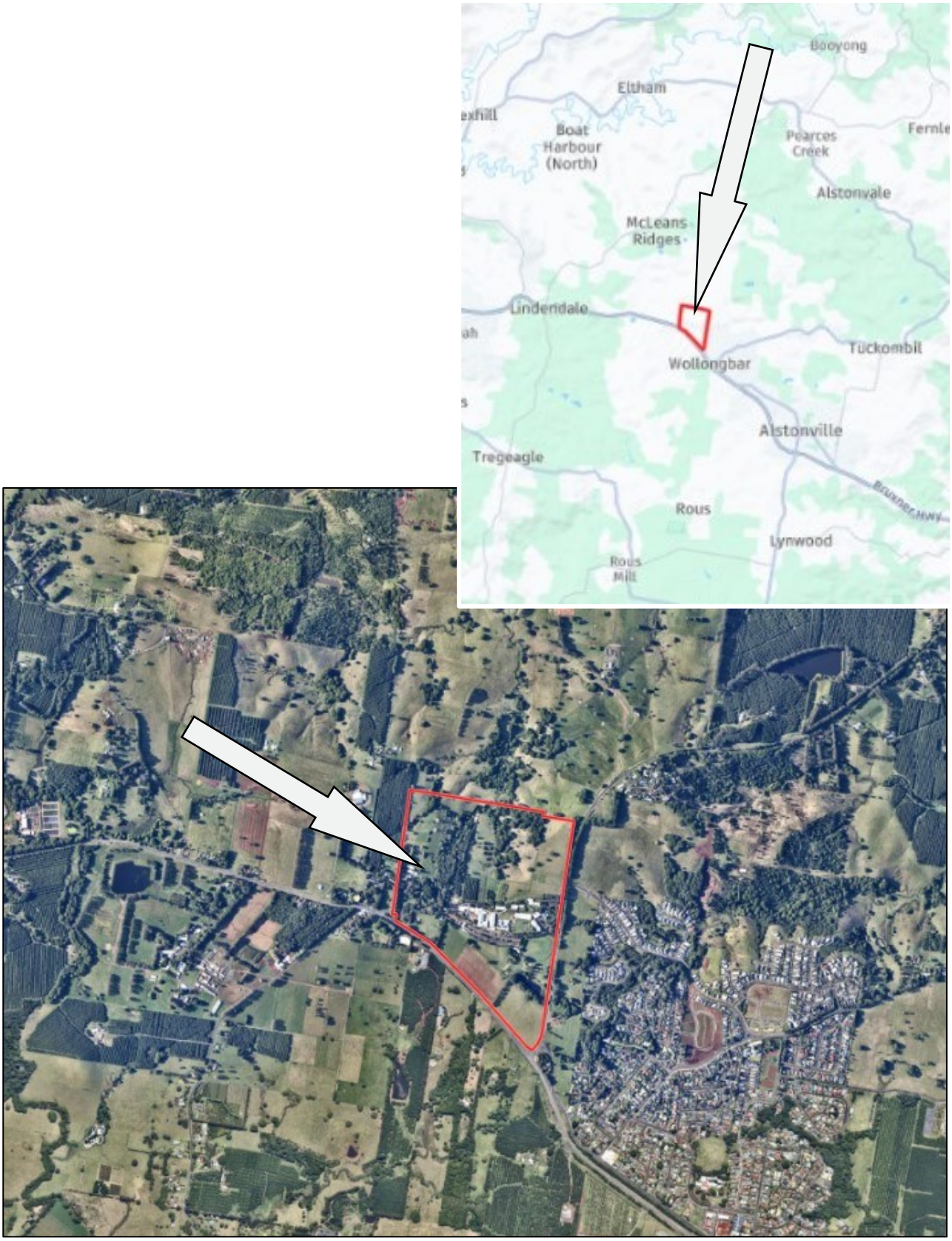


Figure 1 - Surrounding Area (Source: Nearmap 2024)

Figure 2 - Site Boundary (Source: Nearmap 2024)

APPENDIX 2 - SITE PLAN PROPOSED DEVELOPMENT

ACN 002 912 843 I **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 I **F** +61 2 4926 3069
E mail@eje.com.au I **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	28-05-2024	ISSUED FOR REVIEW	CdV	TH	
B	27-06-2024	ISSUE FOR INITIAL COSTING	CdV	TH	
C	08-08-2024	ISSUE FOR COST PLANNING	CdV	TH	
D	20-09-2024	CONCEPT DESIGN ISSUE	CdV	TH	
E	26-09-2024	CONCEPT DESIGN ISSUE	CdV	TH	
F	15-10-2024	PRE-DA ISSUE	CdV/SG	TH	

200mm ON ORIGINAL A1
100mm
50mm
0

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

LOCATION PLAN

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW

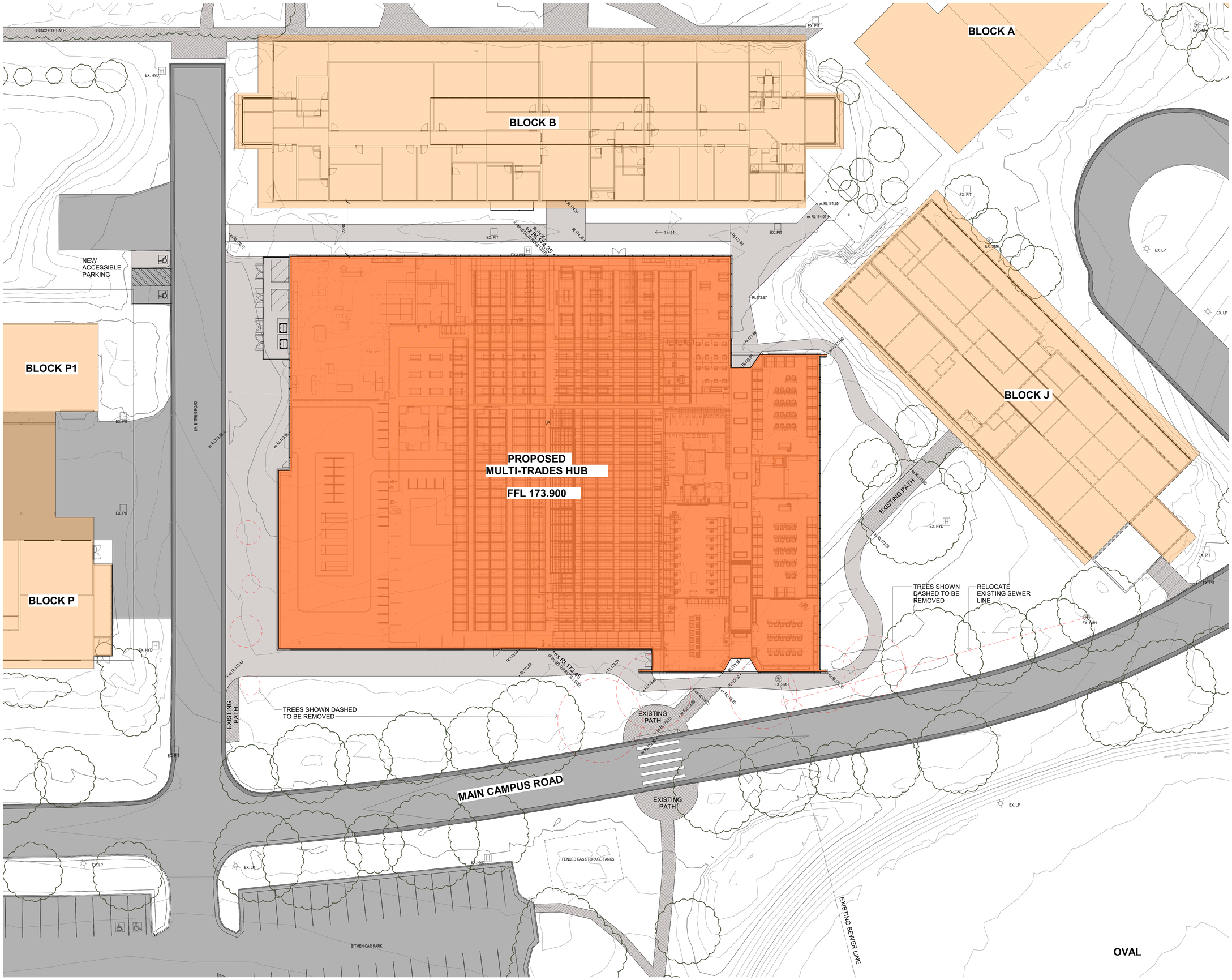
Bundjalung Country

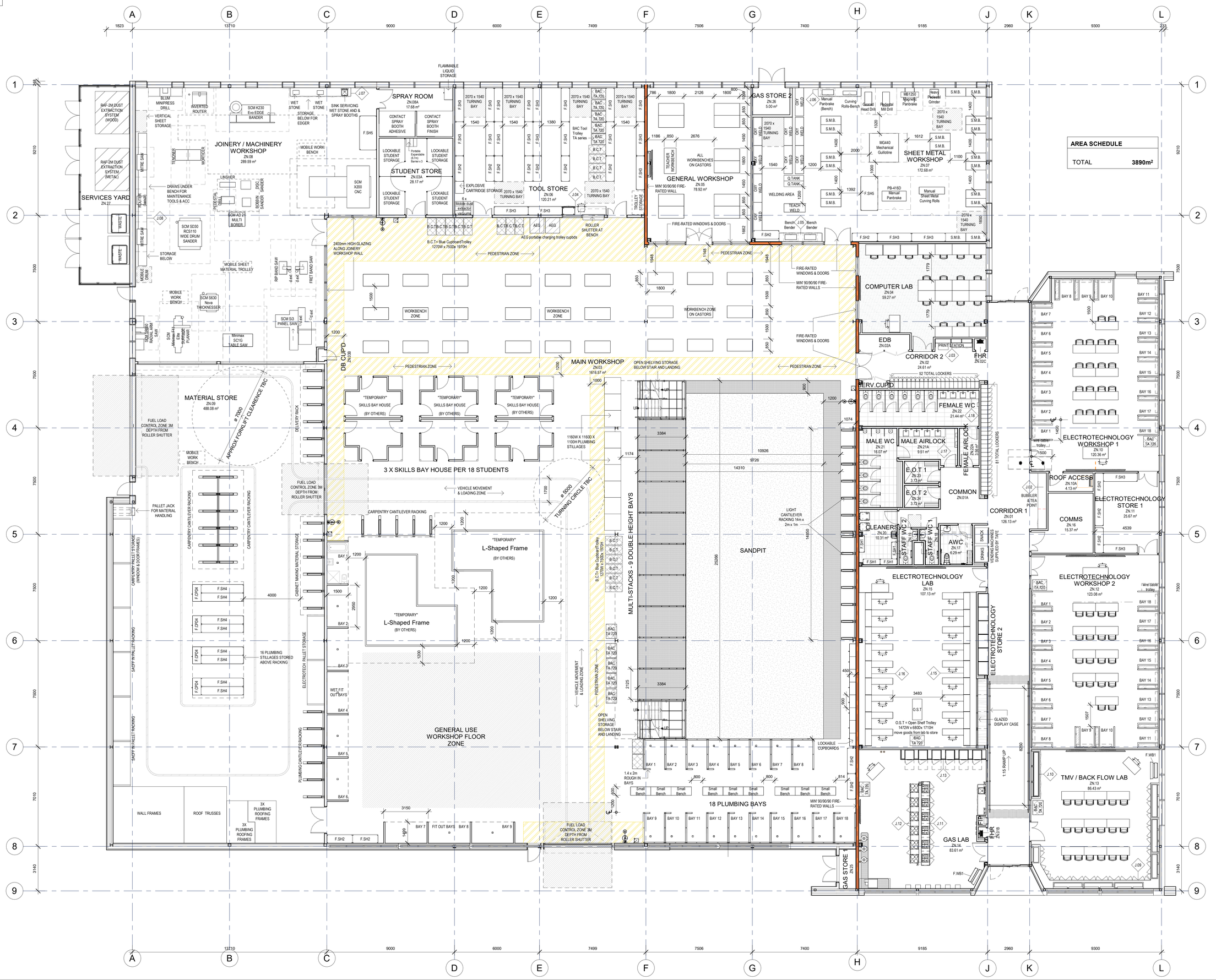
DRAWN :	PROJECT No :
SR	15223

SCALE :	DATE :
1 : 500 @ B1	MAY 2024

PHASE :	DRAWING No :	REV :
SD	A-010	F

EJE


BLOCK A
BLOCK B
BLOCK J
BLOCK P
BLOCK P1
PROPOSED
MULTI-TRADES HUB
FFL 173.900
NEW
ACCESSIBLE
PARKING
CONCRETE PATH
EX. BITMEN ROAD
EX. PIT
EX. HYD
EX. SMH
EX. LP
EX. LR
ex RL174.35
(0.45m BELOW FFL)
ex RL174.25
(0.45m BELOW FFL)
ex RL173.45
(0.45m BELOW FFL)
ex RL174.20
ex RL174.01
ex RL173.90
ex RL173.87
ex RL173.80
ex RL173.30
ex RL173.90
ex RL173.80
ex RL173.80
ex RL173.80



ACN 002 912 843 | ABN 82 644 649 849
Nominated Architect - Barnard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 | F +61 2 4926 3069
E mail@eje.com.au | W www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	28-05-2024	ISSUED FOR REVIEW	CdV	TH	TH
B	27-06-2024	ISSUE FOR INITIAL COSTING	CdV	TH	TH
C	08-08-2024	ISSUE FOR CONSTRUCTION	CdV	TH	TH
D	09-09-2024	PRELIMINARY CONCEPT DESIGN ISSUE	CdV	TH	TH
E	20-09-2024	CONCEPT DESIGN ISSUE	CdV	TH	TH
F	26-09-2024	PRE-DA ISSUE	CdV	TH	TH
G	15-10-2024		CdV	TH	TH

CLIENT :

TAFE NSW

DRAWING :

FLOOR PLAN

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW

Bundjalung Country

DRAWN :	PROJECT No :
CdV	15223

SCALE :	DATE :
1 : 100 @ B1	MAY 2024

PHASE :	DRAWING No :	REV :
SD	A-100	G

APPENDIX 3 - TEMPORARY WASTE STORAGE AREA - DEMOLITION

WASTE MANAGEMENT PLAN

TEMPORARY WASTE STORAGE AREA DURING DEMOLITION

Proposed Demolition Area

BLOCK A

BLOCK B

BLOCK P1

BLOCK P

BLOCK J

EX. BITMEN ROAD

EXISTING PATH TO BE RETAINED

EXISTING HYDRANT TO BE RELOCATED

Existing Path and Carpark to be demolished

Existing Tennis Court & Rotunda to be demolished

Existing Path to be demolished

TREES SHOWN DASHED TO BE REMOVED

PATHS SHOWN DASHED TO BE DEMOLISHED

EXISTING SEWER LINE TO BE RELOCATED

MAIN CAMPUS ROAD

Waste Storage Area:

1 x 10m³ Skip bin (Co-mingled recyclables)

1 x 10m³ Skip bin (General waste)

Wollongbar TAFE
Lot 10 DP 874987
61 Sneaths Road
Wollongbar NSW

Job: HMC2024.1088
Drawing: HMCDWG2024.1088
Date: January 2025
Revised:
Drawn: MF
Base: EJE Architecture - Site Plan

PROPOSED LAYOUT OF WASTE STORAGE AREA IS GENERAL ONLY AND IS TO BE CONFIRMED ON SITE BY SITE MANAGER

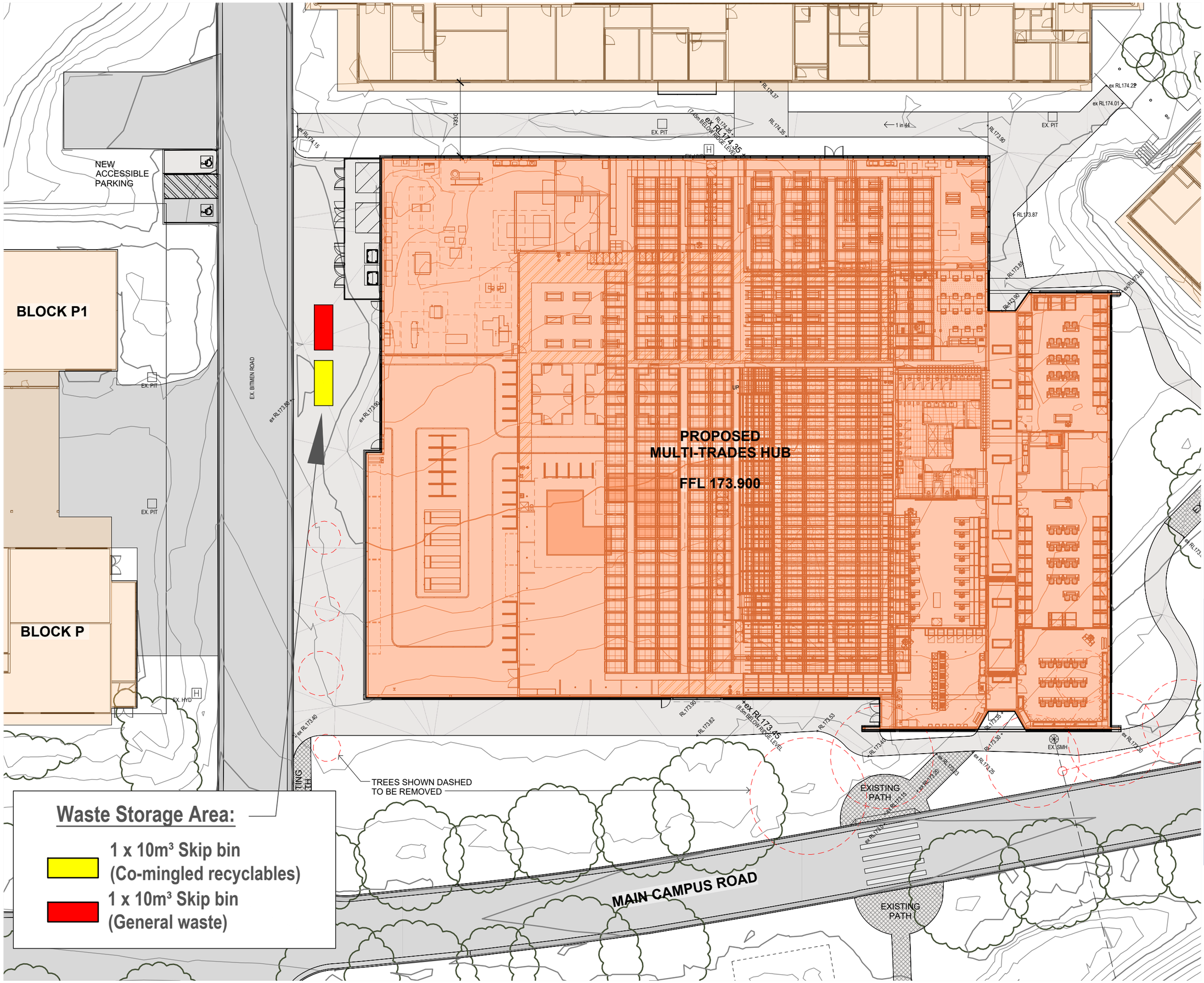
HMC ENVIRONMENTAL CONSULTING Pty Ltd
Tweed Heads NSW
0755368863
www.hmcenvironment.com.au
admin@hmcenvironment.com.au

APPENDIX 4 - TEMPORARY WASTE STORAGE AREA - CONSTRUCTION

SITE WASTE MINIMISATION AND MANAGEMENT PLAN

TEMPORARY WASTE STORAGE AREA DURING CONSTRUCTION

Proposed Structure



Waste Storage Area:

1 x 10m³ Skip bin (Co-mingled recyclables)

1 x 10m³ Skip bin (General waste)

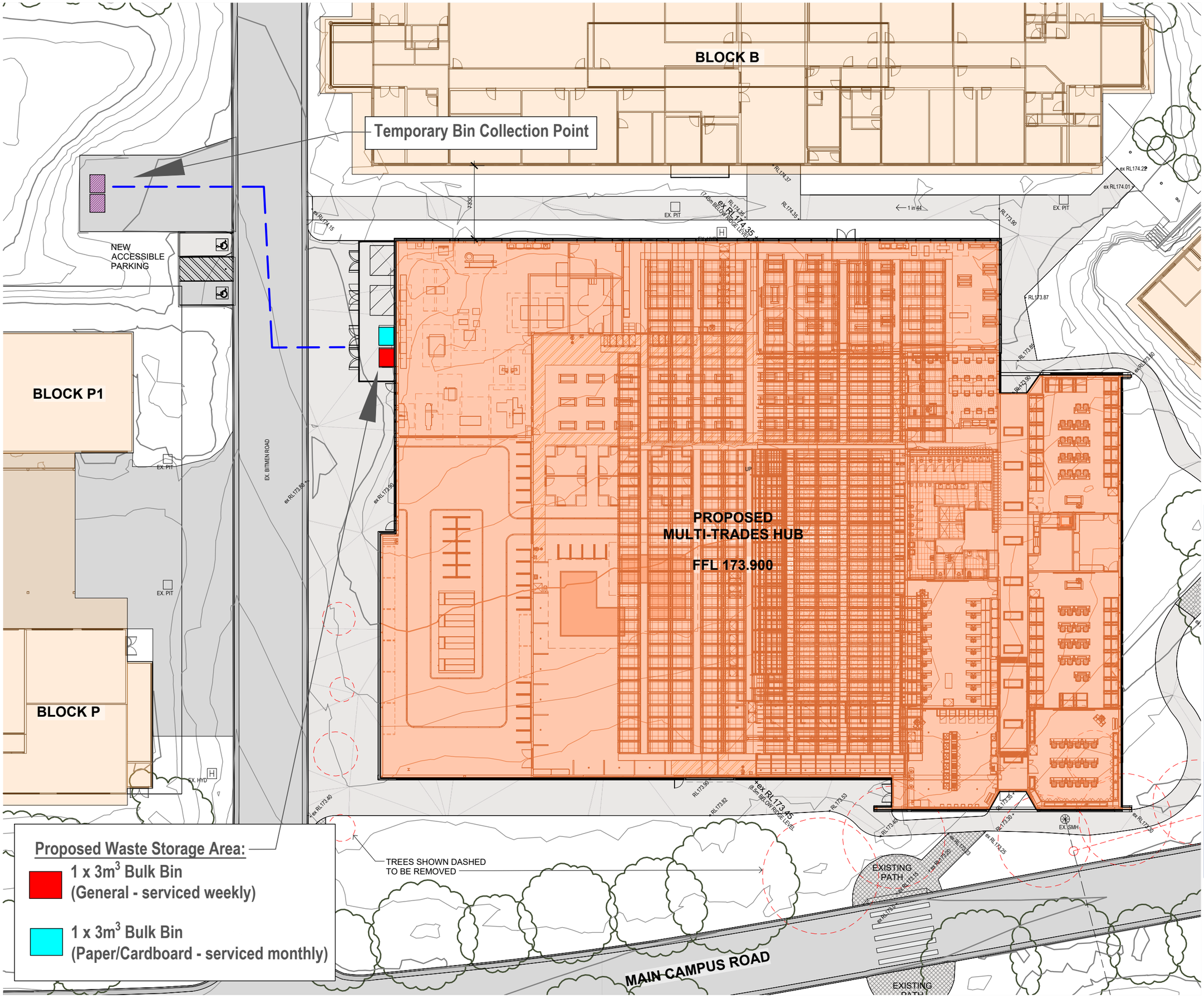
Wollongbar TAFE
Lot 10 DP 874987
61 Sneaths Road
Wollongbar NSW

Job: HMC2024.1088
Drawing: HMCDWG2024.1088
Date: January 2025
Revised:
Drawn: MF
Base: EJE Architecture - Site Plan

PROPOSED LAYOUT OF WASTE STORAGE AREA IS GENERAL ONLY AND IS TO BE CONFIRMED ON SITE BY SITE MANAGER

HMC
ENVIRONMENTAL CONSULTING Pty Ltd
Tweed Heads NSW
0755368863
www.hmcenvironment.com.au
admin@hmcenvironment.com.au

APPENDIX 5 - WASTE STORAGE AREA - OCCUPATION



SITE WASTE MINIMISATION AND MANAGEMENT PLAN

WASTE STORAGE AREA DURING OCCUPATION

Bin Path of Travel to Collection Point

Wollongbar TAFE
Lot 10 DP 874987
61 Sneaths Road
Wollongbar NSW

Job: HMC2024.1088
Drawing: HMCDWG2024.1088
Date: January 2025
Revised:
Drawn: MF
Base: EJE Architecture - Site Plan

PROPOSED LAYOUT OF WASTE STORAGE AREA IS GENERAL ONLY AND IS TO BE CONFIRMED ON SITE BY SITE MANAGER

HMC
ENVIRONMENTAL CONSULTING Pty Ltd
Tweed Heads NSW
0755368863
www.hmcenvironment.com.au
admin@hmcenvironment.com.au

APPENDIX 6 - TYPICAL BIN SIZES

CONTAINER SPECIFICATIONS

Plastic (polyethelene)

Capacity	120L	240L	660L	1100L
Height	0.92m	1.075m	1.235m	1.485m
Width	0.54m	0.58m	1.36m	1.36m
Length	0.62m	0.715m	0.765m	1.07m
Weight	9.5kg	13.5kg	45kg	65kg

**Availability of the complete suite of bin sizes varies across states. Sizes are approximate measurements and may vary by location.*

Figure 3 Typical Rear Lift Collection Receptacle Sizes (SUEZ Environment)

BIN SIZES

2m3 Skip Bin

Height: 0.86m
Length: 1.8m
Width: 1.4m

Safe working load: 2 tonne

4m3 Skip Bin

Height: 1m
Length: 3.1m
Width: 1.75m

Safe working load: 4 tonne

7m3 Skip Bin

Height: 1.2m
Length: 4.1m
Width: 1.85m

Safe working load: 7 tonne

10m3 Skip Bin

Height: 1.6m
Length: 4.5m
Width: 1.85m

Safe working load: 10 tonne

16m Hook Lift

Height: 1.2m
Length: 6m
Width: 2m

Safe working load: 13 tonne

*16m bins have an opening at one end of the skip for easy access e.g. wheelbarrows, labourers etc.

Figure 4 Typical Skip Bin Sizes (ProSkips)

APPENDIX 7 - PROSKIPS CONSTRUCTION RESOURCE RECOVERY

PO Box 957
Nerang
Qld 4211

Phone:
(07) 5533 2547

Fax:
(07) 5533 2537

Email:
info@proskips.com.au

ABN:
89 114 580 308

PRO SKIPS
The Professionals in Waste Management
Recycling Specialists

Environmental Policy

Proskips is one of the Gold Coasts leading waste management and recycling companies. We specialise in construction and demolition waste. The company is locally owned and operates it's own waste transfer station. As a responsible corporate citizen we have chosen to work closely with the Environmental protection agency to adopt it's best business practice methods of dealing with all our C&D waste.

The EPA classify all waste transfer stations with a capacity of 20,000t or more a year to be an ERA-82 (environmentally relevant activity) and as such are required to be licensed by the EPA. Proskips engaged a national environmental planning agency "Planit Consulting" to lodge both the development application to the Gold Coast City Council and the ERA-82 (waste transfer station) to the EPA

The reason we have chosen to go to the expense and time of operating our own waste transfer station is one of economics, which at the same time is good for the environment. We have taken what we believe are the best methods from both European and Australia companies to develop our methods of dealing with C&D waste.

Our goal is to recycle 95% of all waste that comes into the transfer station, with only 5% going to landfill. The break up of our waste is as follows-:

20%	Concrete and Hardcore
20%	Wood
20%	Soil
10%	Green waste
10%	Metal
10%	Plastic
4%	Cardboard & Paper
3%	Gyprock
3%	Other

Recycling Methods

Concrete: All concrete and hardcore is crushed through an impact crusher and screened to several small aggregates and roadbase and is sold back to the building industry for drainage, walls, under slabs etc.

Wood/Green waste: The wood is transported to Rocky Point power station which is then used to generate power for the sugar mill with the excess power being sold to the national grid.

Soil: The soil is screen through a 10mm trommel and sold to landscape gardeners and builders.

PRO SKIPS
The Professionals in Waste Management
Recycling Specialists

PO Box 957
Nerang
Qld 4211

Phone:
(07) 5533 2547

Fax:
(07) 5533 2537

Email:
info@proskips.com.au

ABN:
89 114 580 308

Metal: The metal is separated into copper, aluminium, heavy gauge steel and pig metal then sold to One Steel to be melted down.
Cardboard: All cardboard is transported to Amcor recycling at Molendinar.
Gyprock: The gyprock is transported to Marlyn Compost at Jacobs Well where it is grinded down and added to garden soil and mulches.
Plastic: Landfill
Other: Landfill

This has been a brief outline of our recycling practices, as you can see when using the services of Pro Skips you can be confident of an environmentally conscious business.

These methods of collecting and recycling C&D waste will be adopted for all Constructions jobs on the Gold Coast. I have read through all the criteria for the Green Star rating system, where they are looking for 80% recycling by weight. We can easily achieve this for you as we currently recycle 80-90% by volume – in real terms this would amount to 95% recycling by weight as the only waste we send to landfill is very light after we have taken sand, soil, metal & concrete out of the equation.

To comply with the green star rating system we can give you a monthly environmental report to show the breakdown of waste generated from each job and percentage of waste recycled.

I trust this meets with your approval and assuring you of our best attention at all times

Yours sincerely

John Sheerin
Director

Arboricultural Impact Assessment Report

61 Sneaths Rd

Wollongbar

Client:

EJE

Northern Tree Care
ABN 73 674 526 681
6 Abalone Place, Ballina. NSW 2478
0414 186 161
northerntreecare@me.com

File No: 2447
Version:
10 Dec 2024

Contents

1.	Introduction	3
2.	Scope	3
3.	Method	4
4.	Observations	5
5.	Tree Significance	7
6.	Tree Retention Values	7
7.	Discussion	8
7.	Discussion	10
8.	Recommendations	11
9.	Tree Protection	12
10.	References	14
11.	About The Author	15
12.	Attachment 1 Aerial Photo	16
13.	Attachment 2 Site Plan	17
15.	Attachment 4 Significance of Trees	18
16	Attachment 5 Photos	19

1. Introduction

1.1 Northern Tree Care have compiled this report on request from EJE, who are managing the development of the property at 61 Sneaths Rd, Wollongbar. The proposed development includes the construction of a new a Multi-Trades Hub, on the site.

1.2 A number of trees growing on the property may potentially be impacted by the proposed development.

2. Scope

2.1 The report outlines the trees on the site that may be affected by the proposed development, and assesses their retention value. Where appropriate, recommendations for tree management are provided. Additionally, for trees retained in the development, recommendations for their protection during construction, are included.

3. Method

3.1 The trees were assessed visually from the ground. The diameter at breast height (DBH) was measured at 1.4 m above the ground. The height of the trees were measured using a hypsometer or estimated where the view of the trees was partially obstructed. The conventions and methods recommended in the Australian Standard *AS 4970-2009 Protection of trees on development sites* was used to assess the trees.

3.2 The health and condition of the trees were assessed using the Visual Tree Assessment method (Mattheck & Breloer 2003). This is a method of assessing trees using the body language or shape and features of the tree to indicate their condition. These tree shapes or body language are a reliable indicator of the underlying condition of that part of the tree. The trees were identified using the signs and features present at the time of inspection (Harden et al. 2009).

3.3 The trees were inspected by Lisa Barnes of Northern Tree Care, on 2nd December 2024. This report is compiled from information gathered during the inspection and from plans and documents supplied by EJE. The plans and documents include:

- *Drawing No: A-011. Rev: F. Project No: 15223. Phase: SD. Wollongbar TAFE Multi-Trades Hub. Proposal for Change of Use and Additional New Amenities. EJE. May 2024.*

4. Observations

4.1 The property is described as 61 Sneaths Road, Wollongbar. Lot 10 in DP 874987 and is zoned RU1 Primary Production.

The property is located within the [Local Government Area (LGA)] and is currently used as a TAFE NSW educational facility and agricultural farm. The site includes a grass tennis court and gazebo, connected by footpaths. It is bordered by buildings to the north, east, and west, with a roadway and grassed oval to the south (see Attachment 1: *Aerial Photo*).

The site is situated on an upper hillslope with clay-loam soil. The trees on the property are subject to the provisions of the *Ballina Development Control Plan, Chapter 2a: Vegetation Management (2012)*. Only the trees likely to be impacted by the proposed development are assessed in this report.

The subject trees are all planted, local native species. The majority are large, mature Australian Teak trees, with the exceptions of trees # 1, 2, 3, and 4, which are semi-mature Brush Box, estimated to be 5-10 years old. A detailed description of these trees is provided in Table 1. *Tree Data.*

Table 1. Tree Data.

Tree #	Name	Age	Health	Height m	DBH mm	Crown m	TPZ m
1	Brush Box *Lophostemon confertus*	Semi-mature	Good	<6	170	3	-
2	Brush Box *L. confertus*	Semi-mature	Poor	<6	130	2	-
3	Brush Box *L. confertus*	Semi-mature	Good	<6	160	3	-
4	Brush Box *L. confertus*	Semi-mature	Good	<6	130 100	3	-
5	Australian Teak *Flindersia australis*	Mature	Fair	6-10	210	5	-
6	Australian Teak *F. australis*	Mature	Fair	6-10	520	8	-
7	Australian Teak *F. australis*	Mature	Fair	6-10	430	8	-
8	Australian Teak *F. australis*	Mature	Good	6-10	550	7	-

Table 1. Tree Data Continued.

Tree #	Name	Age	Health	Height m	DBH mm	Crown m	TPZ m
9	Australian Teak *F. australis*	Mature	Good	6-10	500	7	-
10	Australian Teak *F. australis*	Mature	Fair	6-10	520	6	6.2
11	Australian Teak *F. australis*	Mature	Fair	6-10	640	14	7.7
12	Australian Teak *F. australis*	Mature	Fair	6-10	330	5	-
13	Australian Teak *F. australis*	mature	Good	6-10	660	10	7.9
14	Australian Teak *F. australis*	Mature	Fair	6-10	300	8	3.6

5. Tree Significance

5.1 When considering the retention value of trees, two major issues were considered. They are the significance of the tree and its estimated life expectancy.

5.2 When assigning a value to the significance of the tree, a number of factors should be considered (Moreton 2003). The significant outcomes have been determined in Attachment 4. *Significance of Trees in the Landscape.*

6. Tree Retention Values

Landscape Significant Rating								
Est. Life Expectancy years		Significant	Very High	High	Moderate	Low	Very Low	Insignificant
		High retention value			Moderate retention value		Low	Very Low
	>40							
	15-40				# 13, 14			
	5-15						# 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	
	< 5							
	Dead							

Ref: Modified from Couston, Howden (2001) *Tree Retention Values Table*. Footprint Green Pty Ltd, Sydney Australia.

6.1 Where trees have a high retention value they should be retained if possible. Where the development is considered to be more important than the trees they may be removed (Barrell 2006).

7. Discussion

7.1 The proposal is to demolish the existing grassed tennis court, and construct a new Multi-trades Hub, at the site (see Attachment 2. *Site Plan*).

7.2 The plan is to remove trees # 1, 2, 3, 4, 5, 6, 7, 8, 9, and 12, as they fall within the development footprint. The intention is to retain trees # 10, 11, 13, and 14, during construction.

7.3 The subject trees are assessed as having a low retention value, apart from trees #13 and 14, which are assessed as having moderate retention value (see Attachment 3. *Photos*).

7.4 The development will not cause any of the trees proposed to be retained to become unviable. Roots lost during construction, can be replaced by growing new roots. There are areas available for the growth of new roots contiguous with their existing root systems.

8. Recommendations

8.1 It is recommended that the development proceed as proposed. It is advised that trees # 1, 2, 3, 4, 5, 6, 7, 8, 9, and 12, within the footprint of the new development, be removed to allow construction.

8.2 It is recommended that trees # 10, 11, 13, and 14, be retained and protected during construction. Where trees have not been described, but are located near the works, they should be also be fenced off for protection. The specifications for the protection of the trees are given in 9. *Tree Protection*.

8.3 Where roots are required to be severed in order to construct the Multi-trades Hub, it is recommended that the roots be broken off with earthmoving equipment, rather than by being cleanly cut. A recent study has shown that contrary to the guidance provided by *AS 4970-2009* (Sect. 4.5.4), a better response is obtained when roots are broken off, rather than being cleanly cut (Gray 2023).

9. Tree Protection

9.1 The trees retained on the site should be protected during construction in accordance with the recommendations of *AS 4970-2009*. The Standard sets out a Tree Protection Zone that is calculated to be an area around the tree with a radius of 12 x diameter at breast height (DBH). The TPZ has a minimum of 2 m and maximum of 15 m. The TPZ should be protected during construction as effectively as is practicable.

9.2 The Standard lists activities that are prohibited in the TPZ. They are:

- Machine excavation
- excavation for silt trenching
- cultivation
- storage
- preparation of chemicals, including preparation of cement products
- parking of vehicles and plant
- refuelling
- dumping of waste
- wash down and cleaning of equipment
- placement of fill
- lighting of fires
- soil level changes
- temporary or permanent installation of utilities and signs and
- physical damage to the tree.

9.3 The proposed construction of the development is planned to be undertaken within the TPZ of the tree. In order to ensure that the tree remains viable it is important to protect it during construction as much as is practicable. Any of the activities detailed above should not be undertaken in the TPZ of the tree unless absolutely necessary. An enclosed 1.8 -metre-high wire-mesh protective panel fence, is required to be erected around the trees. An example of a suitable fence is shown in Figure 1. The location of the fence is shown in Figure 2.

9.4 The protective fencing must be installed before commencement of works and not removed before the building works are completed.

Figure 1. Example of suitable protective fencing.

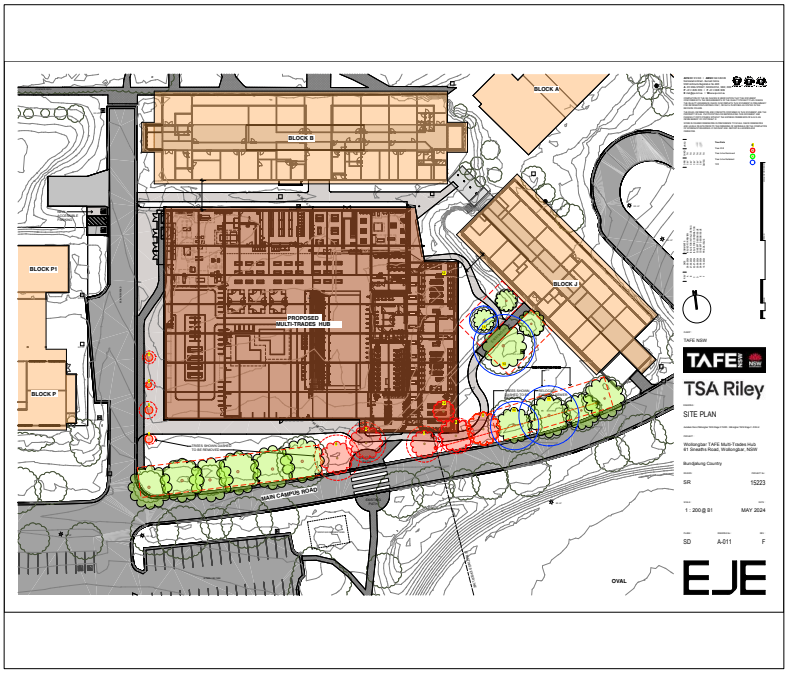


Figure 2. Location of fencing.

10. References

Barrell J. 2006. *Workshop Manual Trees on Construction Sites*. Barrell Tree Consultancy. Brisbane.

Gray P. 2023. *Tree Roots: Cut or Break?* Arbor Age. April/May 2023. Docklands.

Harden G. MacDonald W. Williams J. 2009. *Rainforest Trees and Shrubs*. Gwen Harden Publishing. Nambucca Heads.

Mattheck C. Breloer H. 2003. *The Body Language of Trees*. TSO. London.

Moreton A. 2003. *Criteria for Assessment of Landscape Significance.* 7th National Street Tree Symposium 2006.

Standards Australia. 2009. *AS 4970 Protection of Trees on Development Sites.* Australian Standards. Sydney.

11. About The Author

11.1 This report was compiled by Lisa Barnes of Northern Tree Care. The author is an arborist who has been providing Arboricultural Reports for Local Government, State Government and private clients for over 5 years. Her qualifications include:

- Graduate Certificate of Arboriculture (AQF 8)
- Diploma of Arboriculture (AQF 5)
- Certificate IV in Horticulture (Parks & Gardens)
- Certificate III in Conservation and Ecosystem Management
- Quantified Tree Risk Assessment (QTRA).

11.2 Lisa Barnes is an AQF level 8 Consulting Arborist and General Member with Arboriculture Australia, No. 255990. She is a trained and registered practitioner of QTRA, Registered User number 4531.

11.3 I declare that I have compiled this report impartially using best professional judgement. I have no financial interest in the outcome of the report.

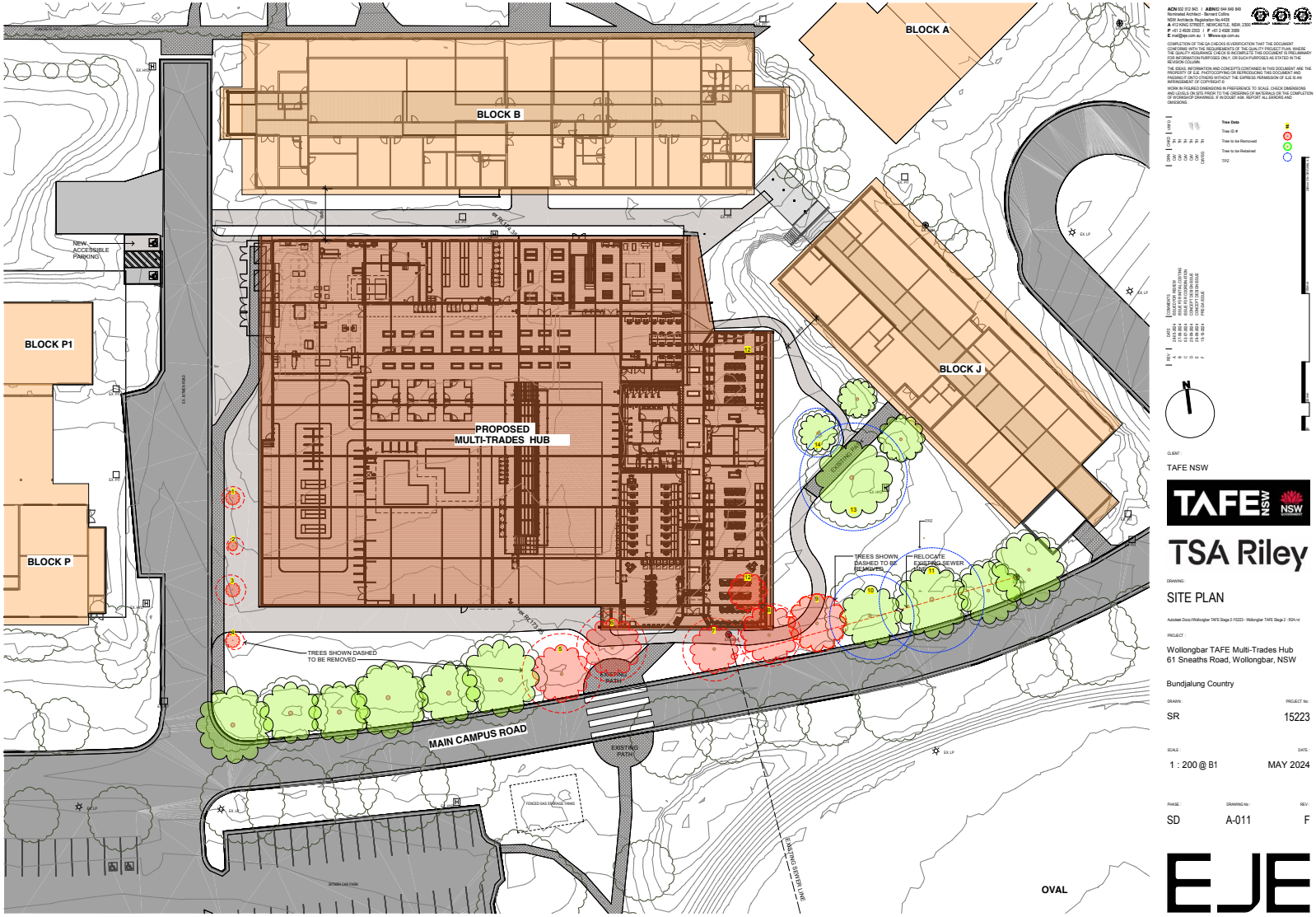
Signed

Lisa J. Barnes

Northern Tree Care

10 Dec 2024

12. Attachment 1 Aerial Photo



NORTHERN TREE CARE

13. Attachment 2 Site Plan

15. Attachment 4 Significance of Trees

Tree #	Name	Condition	Vigour	Protected	Environmental value	Amenity value	Significance
1	Brushbox *L. confertus*	Good	High	No	Med	Low	Low
2	Brush Box *L. confertus*	Poor	Low	No	Low	Low	Low
3	Brush Box *L. confertus*	Good	High	No	Med	Low	Low
4	Brush Box *L. confertus*	Good	High	No	Med	Low	Low
5	Australian Teak *F. australis*	Fair	Low	Yes	Low	Low	Low
6	Australian Teak *F. australis*	Fair	Low	Yes	Med	Mod	Low
7	Australian Teak *F australis*	Fair	Low	Yes	Med	Mod	Low
8	Australian Teak *F. australis*	Good	Mod	Yes	Low	Low	Low
9	Australian Teak *F. australis*	Good	Mod	Yes	Med	Low	Low
10	Australian Teak *F. australis*	Fair	Low	Yes	Med	Low	Low
11	Australian Teak *F. australis*	Fair	Low	Yes	Low	Low	Low
12	Australian Teak *F. australis*	Fair	Low	Yes	Low	Low	Low
13	Australian Teak *F. australis*	Good	Mod	Yes	Mod	Mod	Mod
14	Australian Teak *F. australis*	Fair	Low	Yes	Low	Mod	Mod

16 Attachment 5 Photos

Photo 1. Trees # 1, 2, 3 and 4. Brush Box

Photo 2. Tree # 5. Australian Teak

Photo 3. Tree # 6. Australian Teak

Photo 4. Tree # 7. Australian Teak

Photo 5. Tree # 8. Australian Teak

Photo 6. Tree # 9. Australian Teak

Photo 7. Trees # 10 (right) and 11 (left) Australian Teak

Photo 8. Tree #12. Australian Teak

Photo 9. Trees # 13 (right) and 14 (left) Australian Teak

9 December 2024
Ref No: 5206-1001

EJE Architecture
412 King Street
NEWCASTLE NSW 2300

Attention: Caroli de Villiers

Dear Ms de Villiers

Koala Habitat Impact Assessment Report - Wollongbar TAFE

It is understood that in a recent pre-DA meeting with Ballina Shire Council (Council), a Koala Habitat Impact Assessment was requested to accompany the lodgement of the DA, at Wollongbar TAFE Campus (61 Sneaths Road, Wollongbar NSW 2477 – Lot 10 DP874987) (herein referred to as the site).

The Proposal is for the construction of a new single storey, 3,900 m^2 Multi-Trades Hub, to accommodate construction courses, including Carpentry, Cabinet Making, Electrotechnology, Plumbing and other trade training accommodation. Site constraints have necessitated the removal of ten trees of varying sizes and species

Council have noted: "*In accordance with Clause 3.3A of Chapter 2 of the Ballina Shire Development Control Plan 2012, as the subject site contains preferred Koala habitat, a Koala Habitat Impact Assessment report which has been prepared by a suitably qualified person is required to accompany any future development application (whether or not any vegetation removal or pruning works are proposed). The Koala Habitat Impact Assessment must be prepared in accordance with the structure set out in Table 5 of the Ballina Shire Core Koala Habitat Comprehensive Koala Plan of Management (CKPoM) and must address the matters for consideration set out in section 5.5 of the CKPoM*."

This Koala Habitat Impact Assessment Report has been undertaken in accordance with the Ballina Shire Koala Management Strategy 2017 (BSKMS) (Ballina Shire Council, 2017).

PO Box 119
Lennox Head
NSW 2478
Bundjalung Nation
02 6687 7666

PO Box 1446
Coffs Harbour
NSW 2450
Gumbaynggir Country
02 6651 7666

PO Box 1267
Armidale
NSW 2350
Nganyaywana Country
02 6772 0454

Koala Habitat Impact Assessment Report

A Koala Habitat Assessment Report (KHAR) has been prepared to address the requirements set out in Table 5 of the BSKMS.

1.0 Background

Describe the nature of the proposed development.

The Proposal is for the construction of a new single storey, 3,900 m^2 Multi-Trades Hub at the site.

Identify the applicable elements of the Ballina Local Environmental Plan (1987 and/ or 2012) and the Ballina Shire Development Control Plan 2012, including land use zoning for the subject land and its surrounds.

Refer to the statement of environmental effects (SOEE) prepared by the Proponent.

Outline the context in which the report is being prepared.

The KHAR is being prepared to satisfy a request from Council during a pre-DA meeting with the proponent.

Council have noted: "*In accordance with Clause 3.3A of Chapter 2 of the Ballina Shire Development Control Plan 2012, as the subject site contains preferred Koala habitat, a Koala Habitat Impact Assessment report which has been prepared by a suitably qualified person is required to accompany any future development application (whether or not any vegetation removal or pruning works are proposed). The Koala Habitat Impact Assessment must be prepared in accordance with the structure set out in Table 5 of the Ballina Shire Core Koala Habitat Comprehensive Koala Plan of Management (CKPoM) and must address the matters for consideration set out in section 5.5 of the CKPoM*."

2.0 Links to Legislation, Other Plans and Documents

Demonstrate how the report addresses relevant legislation, local, regional and state plans and documents that relate to the proposed development.

Refer to the Statement of Environmental Effects (SOEE) prepared by the Proponent.

3.0 General Description – Study Area

Identify the location and extent of the study area to be covered by the report, including the proposed development footprint and any other areas that may be directly or indirectly impacted by the proposed development. Depending on the scale of the development, some consideration of context may also be necessary.

The study area is defined as the land in which the Proposal occurs (within the site) (refer to **Appendix A**).

The development footprint is confined to an existing maintained lawn area.

Indirect impacts have been considered in terms of the nature, extent, and duration of impacts on Koalas resulting in ongoing occupation of the building.

Describe the type, extent and current condition of existing Koala habitat in the study area. This should occur with reference to Council's preferred and core Koala habitat mapping and the Ballina Koala Habitat Study.

There is no Preferred Koala habitat within the study area.

Secondary A Koala habitat occurs in the western portion of the site, as a row of windbreak trees, as depicted by the Council Intramaps tool (refer to **Figure 1**).

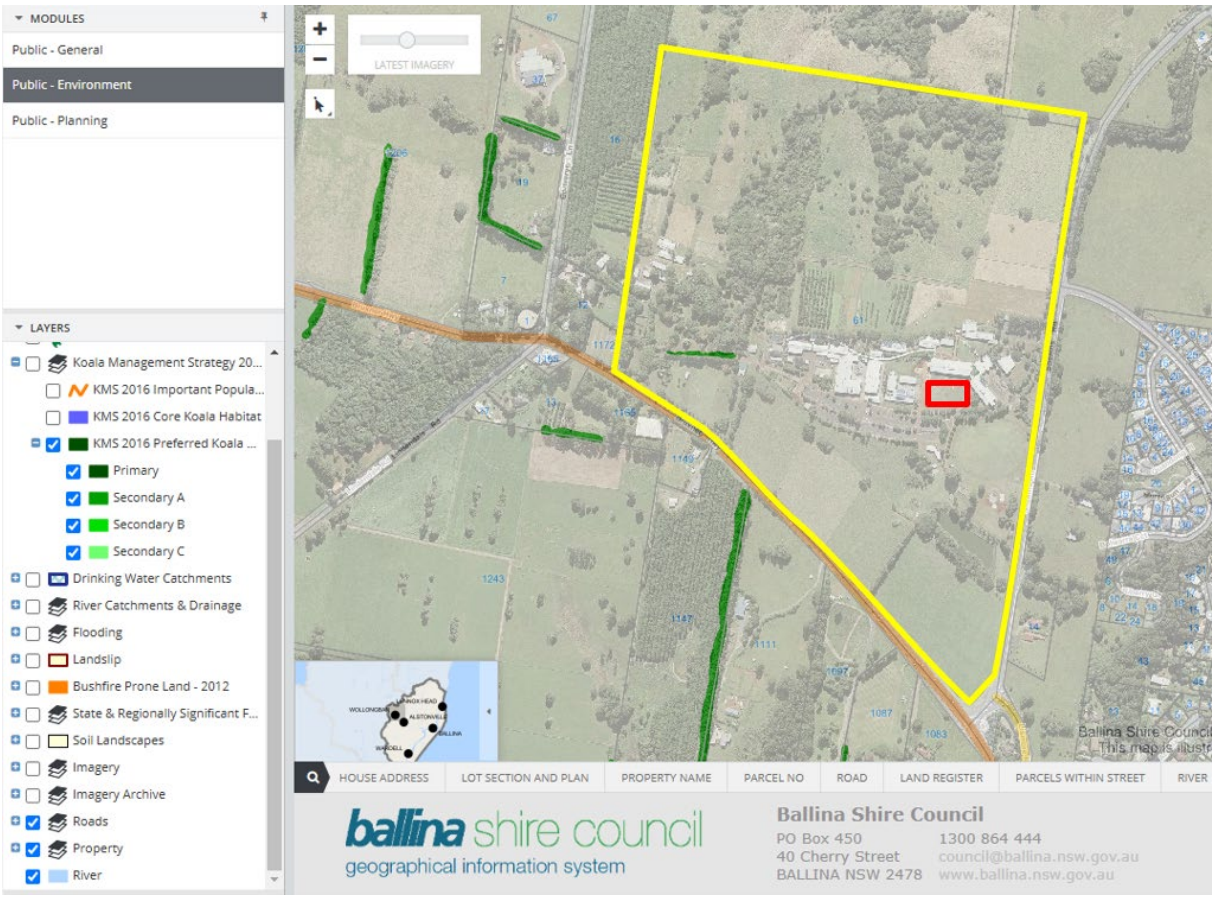


Figure 1 Area of Preferred Koala habitat (Secondary A) (shaded in green) within the site (outlined in yellow), study area (approx) shown by red square. (source: Ballina Shire Council, 2024)

Describe the broader context of other vegetation in the study area and the landscape, including existing and potential corridor linkages.

Preferred Koala habitat occurs more broadly across the landscape as thin, fragmented strips (commonly associated with planted Eucalypt windrows) (refer to **Figure 2**).

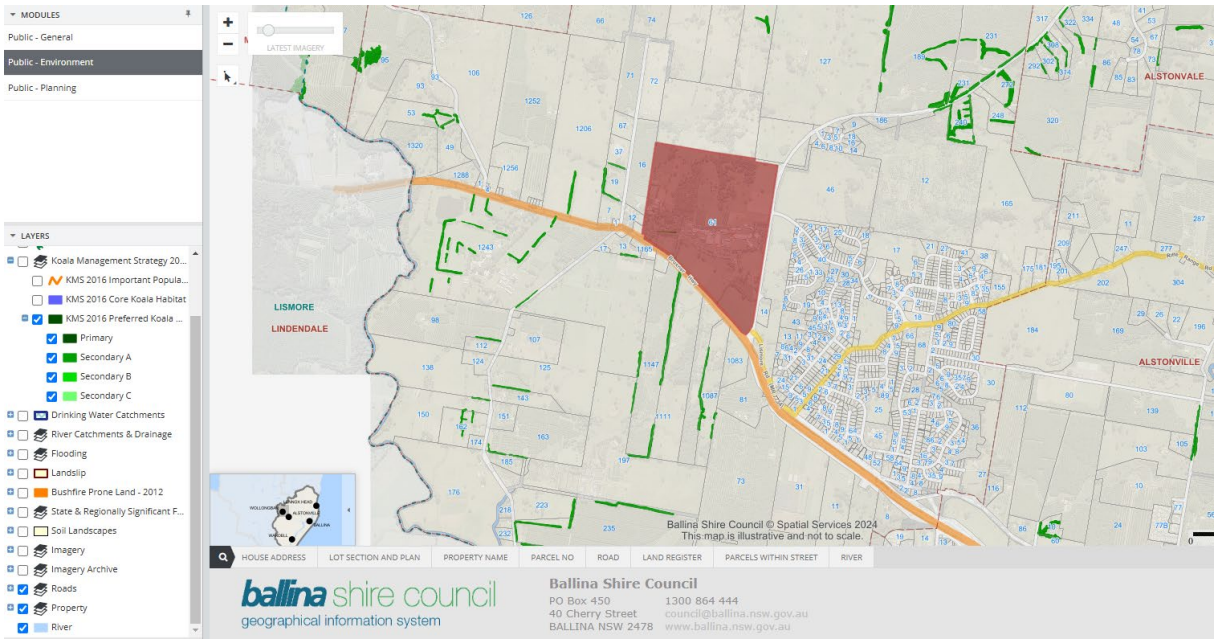


Figure 2 Area of Preferred Koala habitat (shaded in green) within the landscape, site shown in red (source: Ballina Shire Council, 2024)

Vegetation in the landscape is dominated by agricultural land, with occurrences of native rainforest and wet sclerophyll forests (shrubby sub-formation) (refer to **Figure 3**).

Across the broader landscape, the patchwork of native vegetation, mapped preferred Koala habitat, Camphor Laurel dominated communities and to a lesser extent macadamia plantations provide fragmented refuge and Koala movement opportunities.

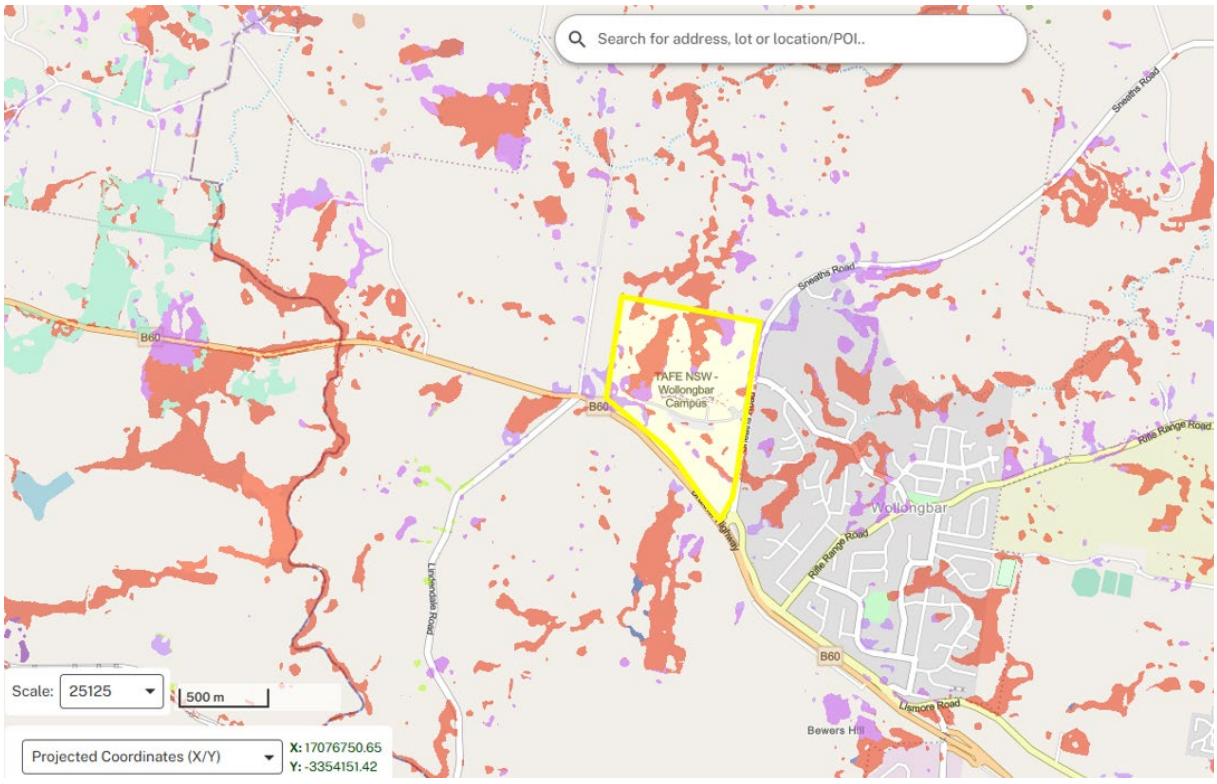


Figure 3 Areas of mapped native vegetation with the landscape, including rainforest (red) and wet sclerophyll forests (shrubby sub-formation) (dark purple). Site indicated by yellow outline. (source: NSW DCCEEW, 2024)

Detail any environmental constraints and any significant or sensitive environmental features of the study area.

The broader site is an education campus, the Proposal is for the expansion of educational facilities. There are no environmental constraints or any significant or sensitive environmental features of the study area, with respect to Koala or their habitat.

4.0 Methodology

Describe in detail the methodology used to survey the vegetation in the study area.

Vegetation proximate to the study area was assessed on foot by GeoLINK Ecologist Jack Hastings on 5 December 2024.

Identify how, where and at what intensities habitat is being utilised, as well as possible resident Koalas.

Koala surveys were undertaken using a modified SAT assessment technique. A brief inspection for arboreal Koalas and faecal pellets was undertaken in trees proximate to the study area.

This included a visual inspection of the tree canopy and a cursory inspection of the undisturbed ground surface within a distance of 1 metre around the base of each tree. Tree species proximate to the study area include Brush Box (*Lophostemon confertus*) and Australian Teak (*Flindersia australis*).

Include a map or plan with a grid overlain to identify initial and detailed RG-bSAT sampling sites.

Not applicable. Modified assessment undertaken (see above).

5.0 Results

Provide an accurate map or plan detailing the location of:

- ***The subject site, proposed development footprint, associated infrastructure and any requirement for an asset protection zone.***

A map of the subject site and proposed development footprint is provided in **Appendix A**.

- ***All vegetation communities, including Koala food trees and any areas of Preferred Koala Habitat or Core Koala Habitat.***

Vegetation at the study area is outlined below and displayed in **Appendix B**. Site photos are provided at **Appendix C**.

A brief overview of vegetation onsite is as follows:

- Planted native street trees (Brush Box and Australian Teak) with a maintained understorey comprising common lawn species such as, Carpet Grass* (*Axonopus spp.*), Couch (*Cynodon dactylon*) and *Centella asiatica*.

*Denotes exotic species.

No Koala feed trees occur within the study area.

- ***Any Koala food trees and/ or Koala habitat proposed to be directly and/ or indirectly impacted, removed, regenerated and/or revegetated. Each of these trees should be shown on the map marked with a unique identifier.***

No Koala food trees and/ or Koala habitat would be directly and/ or indirectly impacted by the proposal.

- ***Any recorded sightings of Koalas or evidence of Koala activity***.

No Koalas were recorded during the site inspection on 5 December 2024.

BioNet search results identified 494 Koala records (as of 05/12/2024) within a 10 km x 10 km search area centred on the site (refer **Figure 4**). There are three records on site from 2018, as part of the Wildlife Rehabilitation Record.

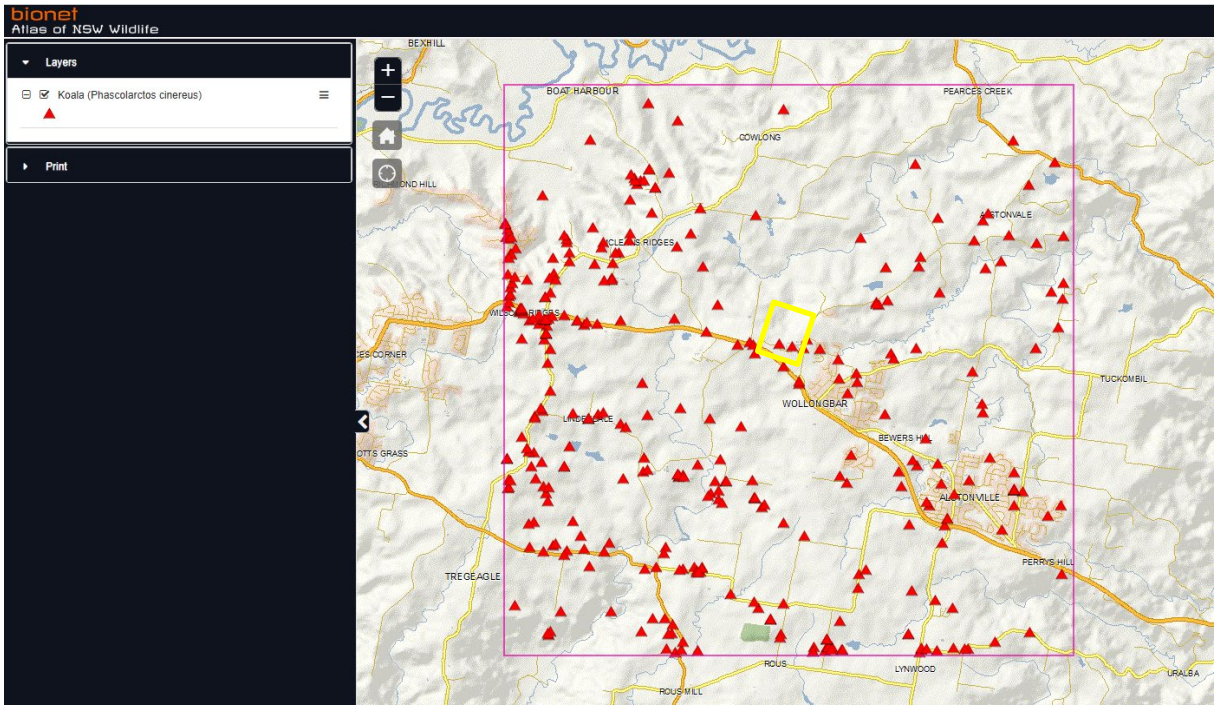


Figure 4 BioNet Koala records centred on the site (approximate site location indicated by yellow square) (source: OEH, 2024)

Provide a table detailing:

- ***The area of all vegetation by vegetation type (including Koala habitat), identifying any area of vegetation to be removed, regenerated or revegetated***.

There is one vegetation type within the study area, comprising planted native street trees with a maintained understorey (0.6 ha) (refer to **Appendix B**).

Six Australian Teak and four Brush Box are proposed for removal. No Koala food trees are proposed to be removed.

- ***The species, size class (250 mm dbhob) and number of food trees that are proposed to be removed, lopped or permanently isolated from Koala use***.

No Koala food trees are proposed to be removed, lopped or permanently isolated from Koala use. No Koala food trees occur within the study area.

6.0 Impact Assessment

Interpret and discuss the results of the Koala habitat assessment.

From a search of trees within the study area no Koala or Koala scats were recorded.

NSW BioNet (OEH, 2024) records indicate several Koala records proximate to the site.

Based on the vegetation on site and lack of Koala feed trees present, scattered trees at the site (and within the study area) provide a forage and refuge resource for any dispersing animals in the locality.

Identify and assess the known or potential direct and indirect impacts of the proposed development on Koalas and Koala habitat.

Direct Impacts

No direct impacts to Koala habitat result from the proposed development.

Indirect Impacts

All Koala habitat on site would be retained and mapped preferred Koala habitat is available in the locality. The home range (and breeding cycle) of Koalas associated with the local population would not be impacted by the proposed development.

Retained Koala feed trees on site (outside of the study area) will continue to provide foraging opportunities, shade and refuge for any dispersing animals in the locality.

Connectivity for Koala will be maintained by the retention of all Koala habitat within the broader site. The proposal is located within the existing urbanised TAFE campus and is unlikely to impede habitat connectivity.

The proposed development will not increase the potential for vehicle strike on Koala.

Any Koalas which may occasionally traverse the site are unlikely to be subject to increased risk of starvation, exposure and loss of shade or shelter.

Address the matters for consideration set out in sections 5.4, 5.5 and 5.6 of the Ballina Shire Core Koala Habitat Comprehensive Plan of Management.

5.5 Matters for Consideration:

5.5.1 Impact Assessment – Proposed Development Involving Clearing

5.5.1.1 Potential direct and indirect impacts on food trees and/ or Koala habitat

No Koala food trees are proposed to be removed, lopped or permanently isolated from Koala use. No Koala food trees occur within the study area.

5.5.1.2 Maintain habitat linkages and safe Koala movement

Connectivity for Koala will be maintained by the retention of all Koala habitat within the broader site. The proposal is located within the existing urbanised TAFE campus and is unlikely to impede habitat connectivity.

5.5.1.3 Location of bushfire asset protection zones

Asset protection zones (if required) will not impact Koala habitat or Koala food trees.

5.5.1.4 No build zones

N/A - No Koala food trees occur within the study area.

5.5.1.5 Retention of replacement trees and/ or Koala habitat

N/A - No Koala food trees are proposed to be removed, lopped or permanently isolated from Koala use. No Koala food trees occur within the study area.

5.5.1.6 Protection of Koalas, food trees and Koala habitat during construction works

No Koala food trees occur within the study area, tree protection zones for Koala food trees are not relevant to this Proposal.

The following mitigation measures must be implemented throughout the construction phase.

- On the day of clearing and prior to any clearing taking place, all trees within 30 metres of those trees to be cleared are to be inspected for the presence of Koalas from at least two locations by an environmental representative from (or on behalf of) the construction contractor.
- Should Koalas be found on site during the clearing of native vegetation and/ or earthworks the works:
  - Will be temporarily suspended within a range of 30 metres from any tree which is occupied by a Koala.
  - Will avoid any area between the Koala and the nearest areas of habitat to allow the animal to move to adjacent undisturbed areas.
  - Will not resume until the Koala has moved from the tree of its own volition.

5.5.2 Indirect Impact Assessment – All Proposed Development

5.5.2.1 Lot boundary fencing

Not applicable to the subject Proposal. No new lot boundary fencing is proposed.

5.5.2.2 Swimming pools

Not applicable to the subject Proposal. No pools are proposed.

5.5.2.3 Keeping of domestic dogs

Not applicable to the subject Proposal.

5.5.2.4 Road design standards

Not applicable to the subject Proposal. No new roads are proposed.

***Include discussion on alternative options considered and why these options have been identified as not feasible**.*

No other options have been considered.

***Outline compensatory habitat and other mitigation measures proposed to address impacts on Koala habitat and Koalas**.*

No compensatory habitat and other mitigation measures during construction are proposed.

7.0 Conclusion

***Identify any limitations to the assessment, and further issues which may need to be addressed**.*

No limitations have been identified for this assessment.

***Provide a summary of the findings of the assessment report including mitigation measures that are proposed**.*

- No Koala food trees are proposed to be removed, lopped or permanently isolated from Koala use.
- No Koala food trees occur within the study area.
- No direct impact to Koala habitat occurs because of the proposed development.
- Indirect impacts to Koala habitat/ Koalas are negligible as there is no significant change to the existing land use.

The following mitigation measures must be implemented throughout the construction phase.

- On the day of clearing and prior to any clearing taking place, all trees within 30 metres of those trees to be cleared are to be inspected for the presence of Koalas from at least two locations by an environmental representative from (or on behalf of) the construction contractor.
- Should Koalas be found on site during the clearing of native vegetation and/ or earthworks the works:
  - Will be temporarily suspended within a range of 30 metres from any tree which is occupied by a Koala.
  - Will avoid any area between the Koala and the nearest areas of habitat to allow the animal to move to adjacent undisturbed areas.
  - Will not resume until the Koala has moved from the tree of its own volition.

8.0 References

***Include a list of all references cited in the report**.*

Ballina Shire Council (2017). *Ballina Shire Koala Management Strategy*. Ballina Shire Council, Ballina.

Ballina Shire Council (2024). *Online mapping*. [Online, accessed December 2024]. Available: https://ballina.nsw.gov.au/online-mapping

NSW Department of Climate Change, Energy, the Environment and Water (2024). *NSW State Vegetation Type Map*. [Online, accessed December 2024]. Available: https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map

NSW Office of Environment and Heritage (2024). *NSW BioNet Database Search Tool*. [Online, accessed December 2024]. Available: https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet

9.0 Appendices

***Include any additional information or supplementary material pertinent to the development proposal**.*

Refer **Appendix A** and **Appendix B**.

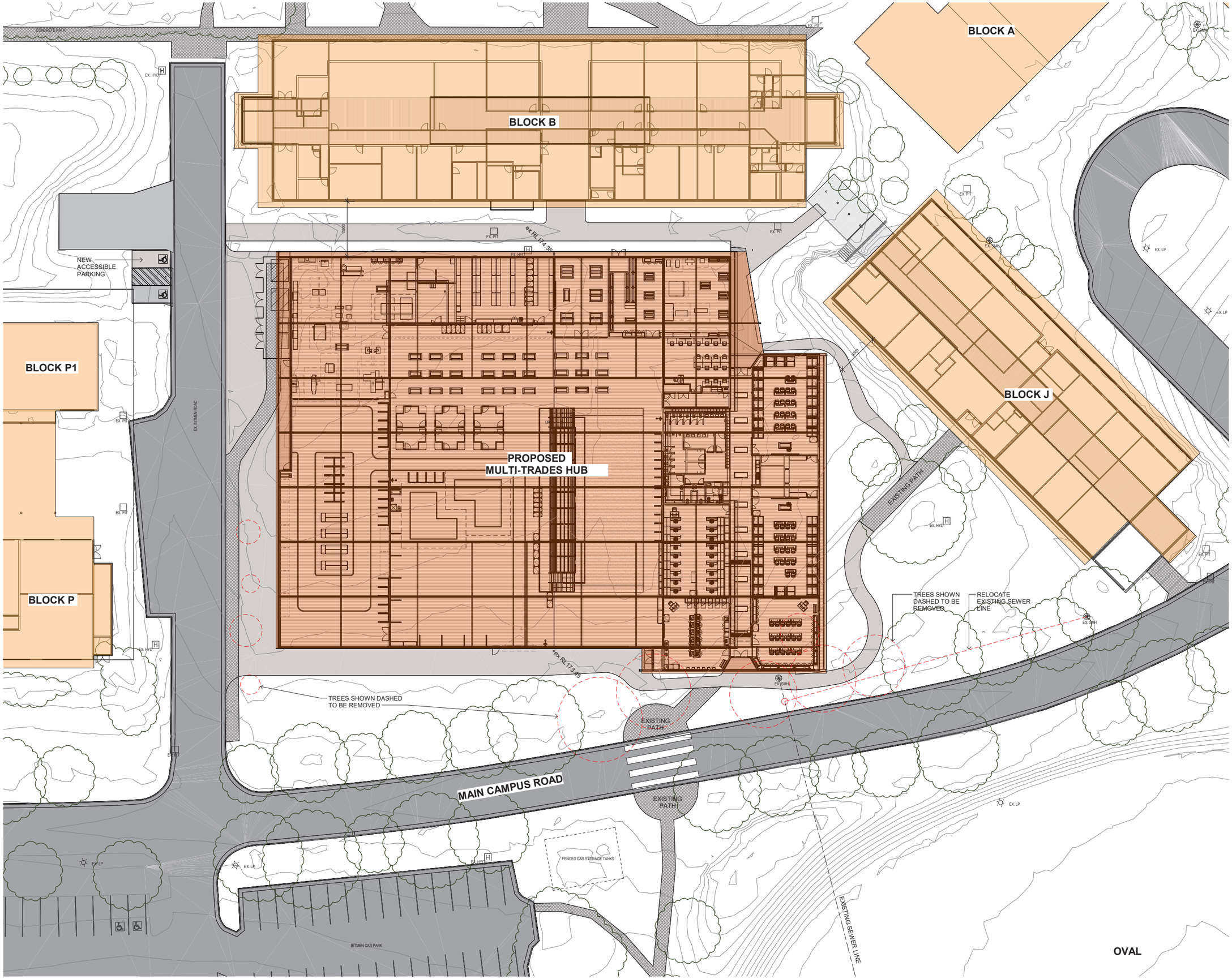
Yours sincerely
GeoLINK

Jack Hastings
Ecologist

UPR	Description	Issued By	Date Issued
5206-1001	Version 1	JRH	09/12/2024

Appendix A

Site Plan



ACN 002 912 843 I **ABN** 82 644 649 849
Nominated Architect - Bernard Collins
NSW Architects Registration No.4438
A 412 KING STREET, NEWCASTLE, NSW, 2300
P +61 2 4929 2353 I **F** +61 2 4926 3069
E mail@eje.com.au I **W** www.eje.com.au

COMPLETION OF THE QA CHECKS IS VERIFICATION THAT THE DOCUMENT CONFORMS WITH THE REQUIREMENTS OF THE QUALITY PROJECT PLAN. WHERE THE QUALITY ASSURANCE CHECK IS INCOMPLETE THIS DOCUMENT IS PRELIMINARY FOR INFORMATION PURPOSES ONLY, OR SUCH PURPOSES AS STATED IN THE REVISION COLUMN.

THE IDEAS, INFORMATION AND CONCEPTS CONTAINED IN THIS DOCUMENT ARE THE PROPERTY OF EJE. PHOTOCOPYING OR REPRODUCING THIS DOCUMENT AND PASSING IT ONTO OTHERS WITHOUT THE EXPRESS PERMISSION OF EJE IS AN INFRINGEMENT OF COPYRIGHT.©

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

REV	DATE	COMMENTS	DRN	CHKD	VRFD
A	28-06-2024	ISSUED FOR REVIEW	C4V	TH	
B	27-08-2024	ISSUE FOR INITIAL COSTING	C4V	TH	
C	02-09-2024	ISSUE FOR CONVENTION	C4V	TH	
D	20-09-2024	CONCEPT DESIGN ISSUE	C4V	TH	
E	26-09-2024	CONCEPT DESIGN ISSUE	C4V	TH	
F	15-10-2024	PRE-DA ISSUE	C4V/SG	TH	

200mm GRADS/ROAD_A1

CLIENT :

TAFE NSW

TSA Riley

DRAWING :

SITE PLAN

Autodesk Docs://Wollongbar TAFE Stage 2 /15223 - Wollongbar TAFE Stage 2 - R24.rvt

PROJECT :

Wollongbar TAFE Multi-Trades Hub
61 Sneaths Road, Wollongbar, NSW

Bundjalung Country

DRAWN :	PROJECT No :
SR	15223

SCALE :	DATE :
1 : 200 @ B1	MAY 2024

PHASE :	DRAWING No :	REV :
SD	A-011	F

EJE

Appendix B

Vegetation Mapping and the Proposal

LEGEND

- Study area
- Cadastre
- Proposed multi-trades hub
- Contours at 2 m intervals
- Australian Teak
- Brush Box
- Tree to be removed
- Tree to be retained

0 20 Metres

Vegetation Mapping and the Proposal

GeoLINK environment | engineering | planning | design

Koala Habitat Impact Assessment Report - Wollongbar TAFE
5206-1003

Information shown is for illustrative purposes only
Drawn by: BJM Checked by: AB Reviewed by: JRH
Source of base data: Nearmap 04/10/2024
Date: 9/12/2024

Appendix C

Site Photos

Plate 1. Four Brush Box proposed for removal

Plate 2. Four of the six, Australian Teak proposed for removal proximate to the existing pedestrian crossing

Plate 3. View looking west across the study area – the Proposal is generally confined to cleared lawn area, right of view

BUSHFIRE CERTIFICATE

PROPOSED NEW TAFE EDUCATION BUILDING

LOT 10 DP 874987
61 Sneaths Road, Wollongbar

Date: **24/02/2025**

Prepared for: **TAFE NSW**

NEWCASTLE BUSHFIRE CONSULTING
5 Chartley Street, Warners Bay NSW 2282
(ph) 02 40230149 (mob) 0423 923284
email: mail@newcastlebushfire.com.au

I hereby declare that I am a BPAD accredited bushfire practitioner.

Accreditation No. BPAD16132

Signature

Date 24/02/2025

Couch Family Trust T/A
Newcastle Bushfire Consulting Pty Ltd A.B.N. 96 831 374 298
Bushfire and Building Sustainability Consultants

Document Status

Revision No.	Issue	Description	Reviewed	Approved by Director
1	09/12/2024	Final	E. Davis	P. Couch
2	21/01/2025	Rev A – minor wording amendments	E. Davis	P. Couch
3	24/02/2025	Rev B – additional clarification on construction levels	E. Davis	P. Couch

Prepared By:

Phillip Couch GIFireE
Bach Info Science
Grad Dip Design for Bushfire Prone Areas
FPAA BPAD – Level 3 Accreditation Number BPD-PA-16132
Director Newcastle Bushfire Consulting

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY AND COMPLIANCE TABLES 4
2.0 INTRODUCTION 7
2.1 PURPOSE OF REPORT 7
2.2 PROPOSED DEVELOPMENT 8
2.3 SIGNIFICANT ENVIRONMENTAL FEATURES 8
2.4 ENVIRONMENTAL ASSETS 8
2.5 ABORIGINAL HERITAGE 8
3.0 BUSHFIRE ATTACK ASSESSMENT 8
3.1 VEGETATION CLASSIFICATION 8
3.2 EFFECTIVE SLOPE 12
3.3 BUSHFIRE ATTACK LEVELS 12
3.3 MINIMUM SETBACKS AND ASSET PROTECTION ZONES 12
3.4 COMPLIANCE WITH AIMS AND OBJECTIVES OF PLANNING FOR BUSH FIRE PROTECTION 12
4.0 UTILITY SERVICES AND INFRASTRUCTURE 13
4.1 WATER SERVICES 13
4.2 ELECTRICITY SERVICES 13
4.3 GAS SERVICES 14
5.0 PROPERTY ACCESS 16
6.0 LANDSCAPING MAINTENANCE 17
7.0 EMERGENCY AND MAINTENANCE PLANS 18
7.1 BUSHFIRE MAINTENANCE PLANS 18
7.2 FIRE EMERGENCY PROCEDURES 18
8.0 RECOMMENDATIONS 19
9.0 CONCLUSION 19
10.0 APPENDIX 1.0 – ASSET PROTECTION ZONES SUMMARY 20
11.0 REFERENCES AND DISCLAIMER 21

LIST OF TABLES

TABLE 1 – PROPERTY DETAILS AND TYPE OF PROPOSAL 4
TABLE 2 – BUSHFIRE THREAT ASSESSMENT 4
TABLE 3 – PLANNING FOR BUSH FIRE PROTECTION (2019) SECTION 6 COMPLIANCE 5

LIST OF FIGURES

FIGURE 1 – SITE CONSTRAINTS MAP 10
FIGURE 2 – LOCALITY MAP 11
FIGURE 3 – COUNCIL'S BUSHFIRE PRONE LAND MAP 11
FIGURE 4 – SITE PLAN 15

LIST OF PHOTOGRAPHS

PHOTO 1 - SITE PHOTO LOOKING NORTH 9
PHOTO 2 - NORTHERN GRASSLAND 9
PHOTO 3 - SOUTHERN GRASSLAND 14

1.0 EXECUTIVE SUMMARY AND COMPLIANCE TABLES

This report has assessed the proposed new TAFE multi-trades hub building against the requirements of Section 4.14 of the Environmental Planning and Assessment Act 1979, AS3959 (2018) Construction of buildings in bushfire-prone areas and Planning for Bush Fire Protection (2019).

This report establishes that the development is capable of complying with the acceptable solutions of Planning for Bush Fire Protection (2019).

TABLE 1 – PROPERTY DETAILS AND TYPE OF PROPOSAL

Applicant Name	TAFE NSW		
Site Address	61 Sneaths Road, Wollongbar	**Lot/Sec/DP**	Lot 10 DP 874987
Local Government Area	Ballina	**FDI**	100
Bushfire Prone Land	Yes, mapped bushfire prone land		
Type of development	New TAFE multi-trades hub building	**Type of Area**	Rural/Urban Fringe
Special Fire Protection Purpose	No	**Flame Temperature**	1200K equivalent
Application Complies with Acceptable Solutions	Yes. Relevant specifications and requirements are satisfied	**Referral to NSW Rural Fire Service (NSW RFS) required**	Council determination on referral

TABLE 2 – BUSHFIRE THREAT ASSESSMENT

	North	**East**	**South**	**West**
Vegetation Structure	Grassland	Maintained Land	Grassland	Maintained Land
Distance to Vegetation	100 metres	140 metres	81 metres	140 metres
Accurate Slope Measure	N/A	N/A	3 degrees downslope	N/A
Slope Range	N/A	N/A	>0 to 5 degrees downslope	N/A
PBP (2019) Table A1.12.1 compliance	40 metres	N/A	40 metres	N/A
AS3959 (2018) Bushfire Attack Level (BAL)	BAL-LOW	BAL-LOW	BAL-LOW	BAL-LOW

The general requirements of Table 6.8A apply with a construction level of **BAL-12.5** under AS 3959 or NASH Standard and section 7.5 of PBP required regardless of the BAL.

TABLE 3 – PLANNING FOR BUSH FIRE PROTECTION (2019) SECTION 6 COMPLIANCE

Performance Criteria	Proposed Development Determinations	Method of Assessment
Asset Protection Zone	Minimum setbacks have been determined in accordance with Planning for Bush Fire Protection (2019) Table A1.12.1 and can be achieved within the subject site.	Acceptable Solution
Landscaping	Landscaping shall be in accordance with Planning for Bush Fire Protection (2019) Appendix 4; and fencing is constructed in accordance with section 7.6 ofPlanning for Bush Fire Protection (2019).	Acceptable Solution
Construction	Table 6.8a requires that the building be built to BAL-12.5 under AS 3959 or NASH Standard and section 7.5 of Planning for Bush Fire Protection (2019).	Acceptable Solution
Access – Internal Roads	The internal access roads shall comply with Planning for Bush Fire Protection (2019) Section 6 property access provisions.	Acceptable Solution
Water Supply	The fire hydrant network shall be extended in accordance with AS 2419.1.	Acceptable Solution
Electrical Supply	The existing electrical supply to the local area is via overhead electrical transmission lines. Landscaping onsite should be managed so that no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002). Electrical supply onsite is recommended to be located underground.	Acceptable Solution
Gas Supply	Any proposed gas supply will be located underground.	Acceptable Solution
Emergency and Evacuation Planning	The proposed buildings, open structures and sporting fields shall be included in an emergency management plan for the school which complies with AS 3745-2010 Planning for emergencies in facilities and have specific consideration for bushfire.	Acceptable Solution

Bushfire Certification

This report has been prepared by Phillip Couch, a Fire Protection Association, Bushfire Planning and Design - Alternate Solutions Accredited Practitioner (FPAA BPAD-Level 3) and a Graduate Fire Engineer with the Institution of Fire Engineers. Phillip Couch certifies that the proposed development design conforms to the relevant specifications and requirements of AS3959 (2018) Construction of buildings in bushfire-prone areas and Planning for Bush Fire Protection (2019) detailed in Section 4.14 (1) (b) of the Environmental Planning and Assessment Act 1979.

24/02/2025

Phillip Couch GIFireE
Bach Info Science
Grad Dip Design for Bushfire Prone Areas
FPAA BPAD – Level 3 Accreditation Number BPD-PA-16132

To calculate the relevant BAL rating:

1. The building is classified as a Special Fire Protection Purpose (SFPP) development under Section 8.3.11 of the Planning for Bushfire Protection (2019) guidelines, due to its classification as a public assembly building with a floorspace greater than 500m2.
2. As it is deemed a SFPP development under section 8.3.11, Table 6.8A in the Planning for Bushfire Protection (2019) guidelines outlines the construction performance, which requires a construction level of BAL-12.5.
3. As an SFPP development, the original BAL-LOW assessment assessed in Table 2 is superseded by the requirements specified in Table 6.8A.

Table 6.8a

Performance criteria and acceptable solutions for APZs and construction for SFPP development.

CONSTRUCTION STANDARDS	
the proposed building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.	a construction level of BAL-12.5 under AS 3959 or NASH Standard and section 7.5 of PBP is applied.
VARIATIONS	
Camping and primitive camping: no performance criteria applicable.	N/A.
Bed and breakfast and farmstay: the proposed building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.	construction is applied in accordance with Appendix 1 of PBP.
Ecotourism: the proposed refuge building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.	a construction level of BAL-12.5 or greater is applied to the refuge building in accordance with AS 3959 or NASH Standard and 7.5 of PBP.
Manufactured home estates: the proposed manufactured home can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.	Where an APZ is provided in accordance with Table A1.12.1 in Appendix 1 of this document the construction standards for BAL-12.5 shall apply; or Where an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1 of this document the construction standards for BAL-29 shall apply.

2.0 INTRODUCTION

2.1 PURPOSE OF REPORT

The purpose of this report is to establish suitable bushfire mitigation measures for the proposed new TAFE multi-trades hub building to be constructed at Lot 10 DP 874987, 61 Sneaths Road, Wollongbar, in order for the Council to make determination of the proposed development pursuant to the requirements of Section 4.14 of the Environmental Planning and Assessment Act 1979.

It is noted that the pre-DA (Development Application) meeting with Ballina Council advised that the TAFE building is a classroom and considered to be integrated development and a Special Fire Protection Purpose development, under section 100B (6) of the Rural Fires Act 1997, so a Bushfire Safety Authority must be obtained from NSW Rural Fire Service unless other advice is sought from NSW RFS.

Phone consultation was made with NSW RFS Coffs Harbour office Planning and Environmental Services on 9/12/2024 and agreeance was reached with the below legislative interpretation of Planning for Bush Fire Protection (2019).

Planning for Bush Fire Protection (2019) Section 6.3.2 Specific residential-based SFPP explicitly identifies that the residential component of a Tertiary Institution is SFPP, however other uses in tertiary institutions may not be defined as SFPP by the Rural Fires Regulation. These other developments require approval under Section 4.14 of the Environmental Planning and Assessment Act 1979.

There is no residential accommodation at Wollongbar TAFE, and the proposed development has been assessed using Planning for Bush Fire Protection (2019) Section 7 and 8 due to it being a public assembly building exceeding 500 square metres in floor area.

The development is a tertiary education facility and is not subject to National Construction Code 2022 Specification 43.

<u>Features on or adjoining the site that may mitigate the impact of a bushfire on the proposed development</u>
The TAFE campus is surrounded by grazing pasture and sporting fields. The proposed building is surrounded by a car park and existing TAFE buildings. The building is located outside the bushfire prone land map vegetation buffer and is exposed to low to medium ember threat.

<u>Likely environmental impact of any proposed bush fire protection measures</u>
No native vegetation removal is required for the development.

The recommendations within this report address the aims and objectives of Planning for Bush Fire Protection (2019) to reduce the risk of ignition of the TAFE building in a bushfire event.

2.2 PROPOSED DEVELOPMENT

The proposed development includes the construction of a new freestanding multi-trades hub/tertiary educational facility within an existing TAFE campus. No residential accommodation associated with the TAFE is located onsite.

2.3 SIGNIFICANT ENVIRONMENTAL FEATURES

The only known significant environmental feature is that mapped waterways extend through the site.

2.4 ENVIRONMENTAL ASSETS

Portions of the site are mapped within the Biodiversity Values Map and Threshold Tool.

2.5 ABORIGINAL HERITAGE

Searches of NSW National Parks and Wildlife Service's database identify no known aboriginal relics or aboriginal places, as defined by National Parks and Wildlife Act 1974, to exist on the site.

3.0 BUSHFIRE ATTACK ASSESSMENT

3.1 VEGETATION CLASSIFICATION

Potential bushfire hazards were identified from Ballina Council's Bushfire Prone Mapping as occurring within the investigation area. Aerial mapping and inspection of the site reveals that the bushfire prone land map is somewhat inaccurate in respect to the current bushfire hazard.

The major vegetative threats have been determined using Keith (2004) to derive vegetation structures listed in Planning for Bush Fire Protection (2019).

Primary vegetation structures have been identified in Figure 1 – Site Constraints Map and separation distances shown in Table 2 – Bushfire Attack Assessment.

PHOTO 1 - SITE PHOTO LOOKING NORTH

View of the proposed building location looking north. The site is grassed landscaping with classrooms visible in the distance.

PHOTO 2 - NORTHERN GRASSLAND

View of mown grass in the foreground with grassed paddock in the distance. The grassland shows signs of periodic slashing however exceeded 10 centimetres in length at time of site visit.

FIGURE 1 – SITE CONSTRAINTS MAP

FIGURE 2 – LOCALITY MAP
Courtesy of OpenStreetMap

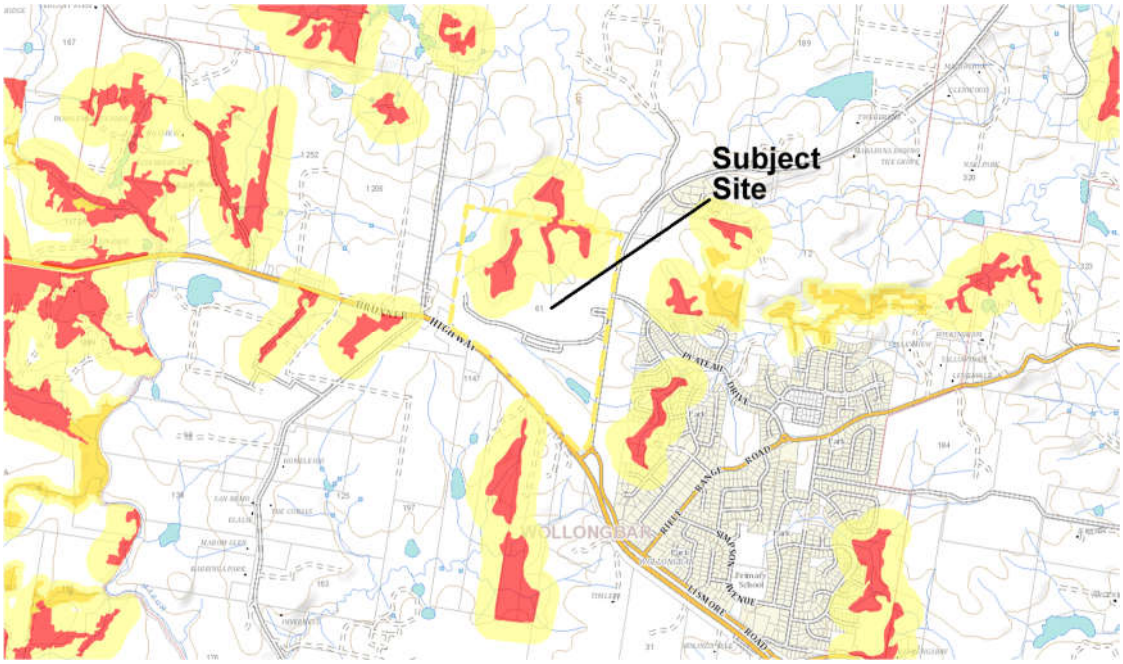


FIGURE 3 – COUNCIL'S BUSHFIRE PRONE LAND MAP

3.2 EFFECTIVE SLOPE

Effective Slope was measured using 2-metre contour data obtained from the Department of Lands and verified by a laser hypsometer on site. The laser hypsometer verified slope within the vegetation, calculating effective fire run slope from 5 separate measurements in each dominant direction.

Effective Slopes have been identified in Figure 1 – Site Constraints Map and slope ranges are shown in Table 2 – Bushfire Threat Assessment.

3.3 BUSHFIRE ATTACK LEVELS

BALs and relevant construction levels in accordance with Planning for Bush Fire Protection (2019) have been demonstrated in Section 1 Executive Summary and Compliance Tables.

3.3 MINIMUM SETBACKS AND ASSET PROTECTION ZONES

Minimum setbacks have been determined in accordance with Table A1.12.1 (Planning for Bush Fire Protection). The minimum Asset Protection Zone for special fire protection purpose development has been demonstrated in Section 1 Executive Summary and Compliance Tables.

The required asset protection zones are available within the subject site.

3.4 COMPLIANCE WITH AIMS AND OBJECTIVES OF PLANNING FOR BUSH FIRE PROTECTION

The aims and objectives of Planning for Bush Fire Protection are addressed below for the proposed development.

Afford occupants of any building adequate protection from exposure to a bushfire
Building exits are available, located away from the nearest bushland threat. Building occupants should be able to evacuate through the primary entry and exit to/from the surrounding managed TAFE campus. Evacuation planning in the event of bush fire should clearly indicate to building occupants to evacuate in a direction away from the fire.

Provide for a defendable space to be located around buildings
Defendable space is available around the building. In the event of bush fire, firefighters will have good access around the building to evacuate building users. A minimum 81-metre asset protection zone shall be managed surrounding the building.

Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevents direct flame contact and material ignition
The building is outside the flame zone and shall be built to the National Construction Code (2022) structural fire safety regulations and BAL-12.5.

Ensure that safe operational access and egress for emergency service personnel and residents is available
The primary access to the facility offers compliance with Planning for Bush Fire Protection access requirements.

Provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)
The building manager shall maintain landscaping and fuel management in accordance with Appendix 4 of Planning for Bush Fire Protection (2019) and the NSW Rural Fire Service's document Standards for Asset Protection Zones.

Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bushfire fighting)
External hydrant spans are in accordance with AS2419.1. Electrical supplies onsite are located underground.

Planning for Bush Fire Protection (2019) Chapter 8 Compliance
Planning for Bush Fire Protection (2019) Section 6.3.2 identifies that tertiary buildings are not defined as Special Fire Protection Purpose development by the Rural Fires Regulation, but require approval under the Environmental Planning and Assessment Act. The proposed building is identified as an assembly building with Planning for Bush Fire Protection (2019) Section 8.3.11 Public assembly buildings applicable, due to the floor space exceeding 500 square metres. This report is issued as a bushfire certificate under EP&A Act s.4.14 (1) (b) however Planning for Bush Fire Protection (2019) Section 8.3.11 notes referral requirements to NSW RFS.

4.0 UTILITY SERVICES AND INFRASTRUCTURE

4.1 WATER SERVICES

A reticulated water supply and street hydrant access are available providing coverage of the development in accordance with AS 2419.1.

4.2 ELECTRICITY SERVICES

The existing electrical transmission lines are located underground and require no additional protection measures.

4.3 GAS SERVICES

- Reticulated or bottled gas to be installed and maintained in accordance with AS1596 (2002) and the requirements of the relevant authorities. Metal piping is to be used.
- Fixed gas cylinders to be kept clear of flammable material by a distance of 10 metres and shielded on the hazard side of the installation.
- Gas cylinders close to the dwelling are to have the release valves directed away from the building and be at least 2 metres from flammable material with connections to and from the gas cylinder being of metal.
- Polymer-sheathed, flexible gas supply lines to gas meters adjacent to the buildings are not to be used.

PHOTO 3 - SOUTHERN GRASSLAND

View of grassed paddock located south of the car park. The grassland exceeds 10 centimetres in length and has been conservatively assessed as grassland.

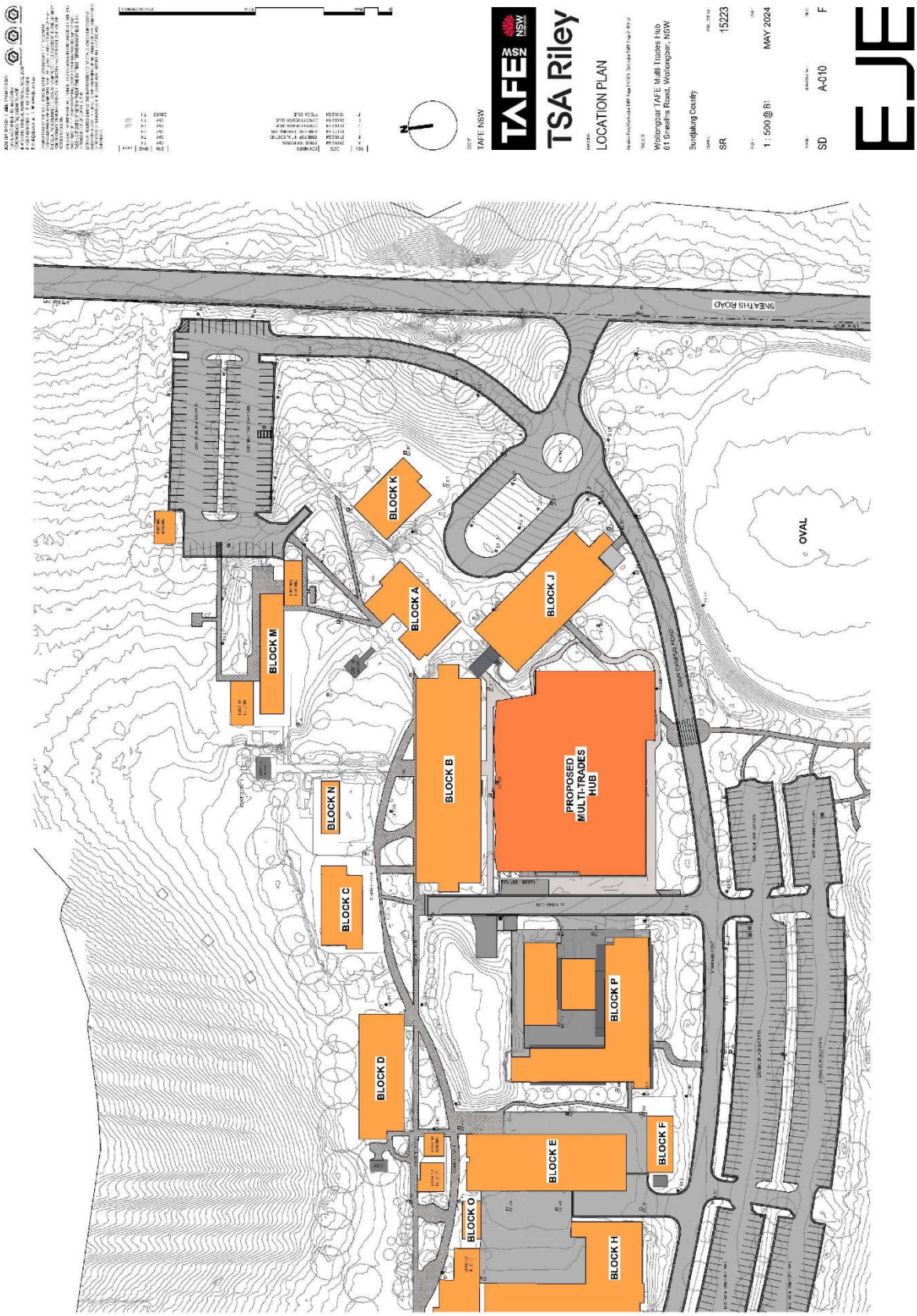


FIGURE 4 – SITE PLAN

5.0 PROPERTY ACCESS

Public Road Access
The subject site is located on Sneaths Road, being a two-way road interconnecting into the local road network. Emergency Services are expected to have good access to the area at most times.

No new public roads are proposed for this development.

Fire Trails
Fire trails do not intersect the vegetation in the local area. No new fire trails are proposed for this development.

Property Access
Property access is by way of Sneaths Road providing access from the public road system directly to the private land, giving firefighters access to the building.

Property access roads shall comply with section 6.8b of Planning for Bush Fire Protection (2019) as detailed below:

ACCESS (GENERAL REQUIREMENTS)	
Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	• Internal roads are two-wheel drive, sealed, all-weather roads. • Access is provided to all structures; • Traffic management devices are constructed so as not to prohibit access by emergency services vehicles; • Access roads must provide suitable turning areas in accordance with Appendix 3; and • One-way-only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.
Compliance: The development can offer full compliance.	
The capacity of access roads is adequate for firefighting vehicles.	The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.
Compliance: The development can offer full compliance.	
There is appropriate access to water supply.	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; Hydrants are provided in accordance with the relevant clauses of AS2419.1 - Fire hydrant installations - System design, installation and commissioning;

Compliance: The development can offer full compliance.

PERIMETER ROADS	
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating, as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	• There are two-way sealed roads; • Minimum 8-metre carriageway width kerb to kerb; • Parking is provided outside of the carriageway width; • Hydrants are located clear of parking areas; • There are through-roads, and these are linked to the internal road system at an interval of no greater than 500 metres; • Curves of roads have a minimum inner radius of 6 metres; • The maximum grade road is 15 degrees and average grade of not more than 10 degrees; • The road crossfall does not exceed 3 degrees; and • A minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches, is provided.
Compliance: No new perimeter roads are provided.	
NON-PERIMETER ROADS	
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	Minimum 5.5-metre carriageway width kerb to kerb; Parking is provided outside of the carriageway width; Hydrants are located clear of parking areas; Roads are through-roads and are linked to the internal road system at an interval of no greater than 500 metres; Curves of roads have a minimum inner radius of 6 metres; The road crossfall does not exceed 3 degrees; and A minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches, is provided.
Compliance: The existing road network will remain largely unchanged.	

6.0 LANDSCAPING MAINTENANCE

It is recommended that landscaping is undertaken in accordance with Planning for Bush Fire Protection (2019) Appendix 4 and be maintained for the life of the development.

Trees should be located greater than 2 metres from any part of the roofline of a building. Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10 metres from an exposed window or door. Trees should have lower limbs removed up to a height of 2 metres above the ground.

The landscaped area should be maintained free of leaf litter and debris. The gutter and roof should be maintained free of leaf litter and debris.

Landscaping should be managed so that flammable vegetation is not located directly under windows.

Ground fuels such as fallen leaves, twigs (less than 6 millimetres in diameter) and branches should be removed on a regular basis, and grass needs to be kept closely mown and, where possible, green.

7.0 EMERGENCY AND MAINTENANCE PLANS

7.1 BUSHFIRE MAINTENANCE PLANS

A bushfire maintenance plan is to be prepared that addresses the following requirements:

a) Contact person/department and details; and
b) Schedule and description of works for the construction of asset protection zones and their continued maintenance.
c) Landscaping shall be managed as outlined within Appendix 4 of Planning for Bush Fire Protection (2019) and the NSW Rural Fire Service's document Standards for asset protection zones.

7.2 FIRE EMERGENCY PROCEDURES

Arrangements for emergency and evacuation are to comply with section 6 of Planning for Bush Fire Protection (2019).

An Emergency/Evacuation Plan is to be prepared consistent with AS 3745 ‘Emergency control organisation and procedures for buildings, structures and workplaces’ which includes consideration of bushfire.

The Bush Fire Emergency Management and Evacuation Plan is to prepared consistent with the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan.

8.0 RECOMMENDATIONS

Based upon an assessment of the plans and information received for the proposal, it is recommended that development consent be granted subject to the following conditions:

1. The proposed building works shall comply with sections 3 and 5 (BAL-12.5) in accordance with AS3959 (2018) Construction of buildings in bushfire-prone areas or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate and the additional construction requirements of Planning for Bush Fire Protection (2019) Section 7.5.2.
2. At the commencement of building works and in perpetuity, the property, for a minimum 81 metres surrounding the building, shall be managed as an inner protection area (IPA) as outlined within Appendix 4 of Planning for Bush Fire Protection (2019) and the NSW Rural Fire Service's document Standards for Asset Protection Zones.
   Note: existing asset protection zones exceed the above minimum distance and are recommended to continue.
3. Water, electricity and gas are to comply with Section 6 of Planning for Bush Fire Protection (2019).
4. Landscaping is to be undertaken in accordance with Planning for Bush Fire Protection (2019) Appendix 4 and managed and maintained in perpetuity.
5. An Emergency/Evacuation Plan is to be prepared consistent with AS 3745 ‘Emergency control organisation and procedures for buildings, structures and workplaces’ which includes consideration of bushfire.
6. The Bush Fire Emergency Management and Evacuation Plan is to prepared consistent with the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan;

9.0 CONCLUSION

The final recommendation is that the proposed development offers compliance with Planning for Bush Fire Protection (2019). There is potential for bushfire attack at this site and a list of recommendations has been included in the above assessment to reduce that risk.

10.0 APPENDIX 1.0 – ASSET PROTECTION ZONES SUMMARY

Below is a summary of Asset Protection Zones outlined in appendix 4 of Planning for Bush Fire Protection (2019) and the NSW Rural Fire Service's "Standards for Asset Protection Zones". The property owner(s) should obtain these two documents and familiarise themselves with their content.

Generally
Asset Protection Zones (APZ) refer to the area between the bushfire threat and the asset (i.e. building). The APZ may contain two areas; the Inner Protection Area (IPA) and the Outer Protection Area (OPA). Some areas should be managed entirely as an Inner Protection Area (IPA). Refer to the plans for locations of APZ and distances from Assets.

Inner Protection Area (IPA)
The inner protection area is located adjacent to the asset and is identified as a fuel-free zone.

A. Shrubs (consisting of plants that are not considered to be trees)

1. Large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be created;
2. Shrubs should not be located under trees;
3. Shrubs should not form more than 10% ground cover; and
4. Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

B. Trees: Maintain a minimum 2-5 metre canopy separation.

1. Tree canopy cover should be less than 15% at maturity;
2. Trees at maturity should not touch or overhang the building;
3. Lower limbs should be removed up to a height of 2m above the ground;
4. Tree canopies should be separated by 2 to 5m; and
5. Preference should be given to smooth barked and evergreen trees.

Outer Protection Area (OPA)
The Outer Protection Area (OPA) is located adjoining the vegetation. The OPA should be maintained as a fuel-reduced area. This assumes trees may remain but with a significantly reduced shrub, grass, and leaf litter layer. In many situations leaf litter and the shrub layer may not require maintenance at all.

A. Shrubs:

1. Shrubs should not form a continuous canopy;
2. Shrubs should form no more than 20% of ground cover.

B. Trees:

1. Existing trees can be retained.
2. Tree canopy cover should be less than 30%; and
3. Canopies should be separated by 2 to 5m.

Grass (throughout the entire asset protection zone)
Grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and leaves and vegetation debris should be removed.

11.0 REFERENCES AND DISCLAIMER

References

Standards Australia AS3959 (2018) Construction of buildings in bushfire-prone areas.

Keith D. "Ocean Shores to Desert Dunes", Department of Environment and Conservation, Sydney, (2004).

Environmental Planning and Assessment Act 1979.

New South Wales Rural Fire Service Planning for Bush Fire Protection (2019).

Disclaimer

Despite the recommendations in this report, it is impossible to remove the risk of fire damage to the building entirely. This report assesses and provides recommendations to reduce that risk to a manageable level. It is of paramount importance that the recommendations are adhered to for the life of the structure and that all maintenance is performed to ensure a level of protection is provided to the building, occupants and firefighters.

Planning for Bush Fire Protection (2019) states that notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small, always remains.

AS3959 (2018) Construction of buildings in bushfire-prone areas states that the standard is designed to lessen the risk of damage to buildings occurring in the event of the onslaught of bushfire. There can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion. External combustible cladding is not recommended.