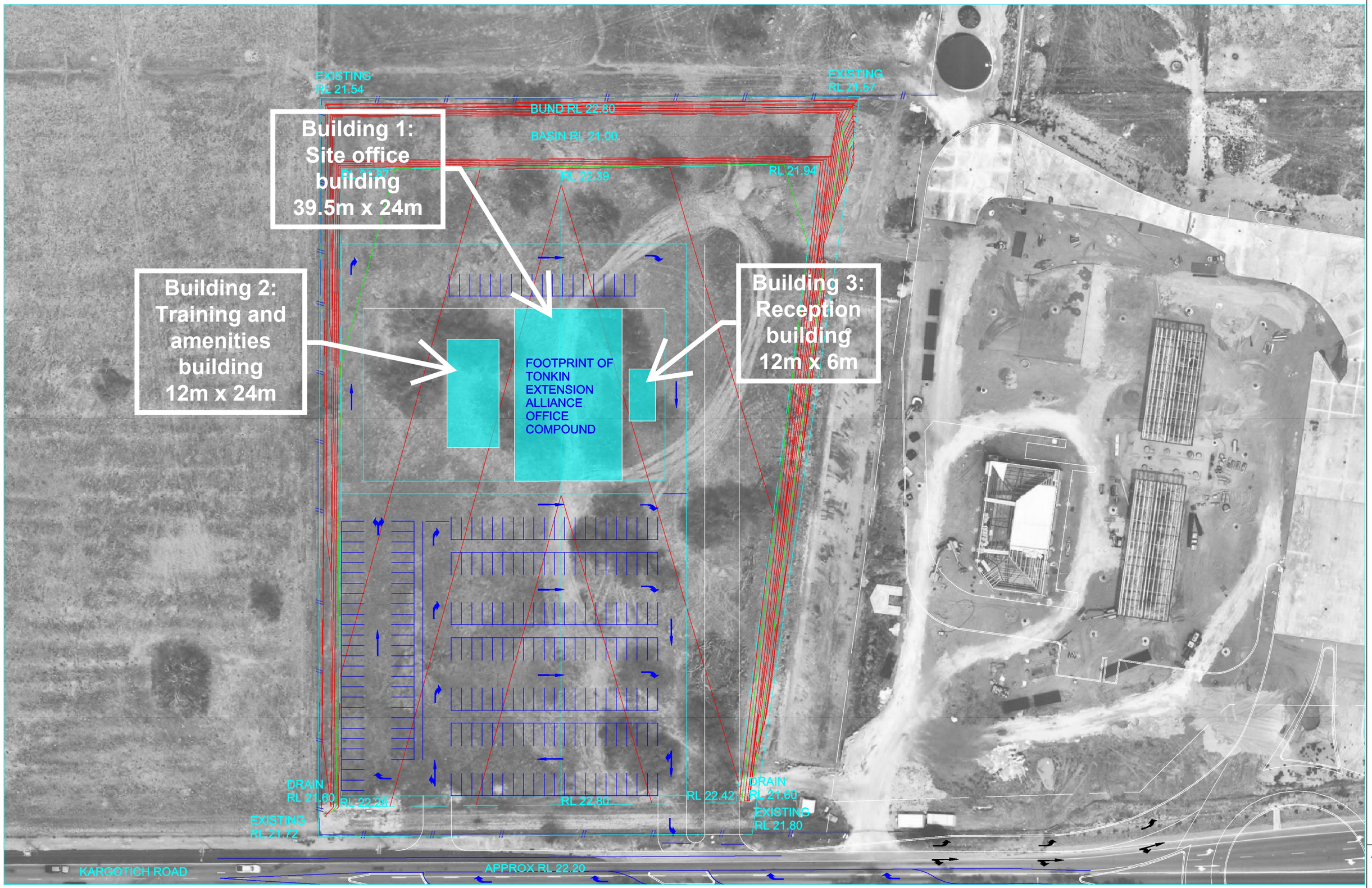


A3

AMENDMENTS		
No.	DESCRIPTION	APPROVED & DATE

DISCALAIMER: PLAN TO BE USED FOR INFORMATION ONLY
SERVICE INFORMATION TO BE CHECKED AND CONFIRMED WITH LOCAL AUTHORITIES SERVICE REPRESENTATION ON PLAN SHOULD BE LOCATED BY A SERVICE LOCATOR PRIOR TO EXCAVATION AND CONFIRMED BY DIALING 1100

METADATA	
COORDINATE SYSTEM	
VERTICAL DATUM	
SURVEYED BY	
DATE OF SURVEY	
DRAWN BY	
12D PROJECT	

DRAWING TITLE

NOTES
Proposed Kargotich Compound
Drainage Plan

DRAWING NUMBER	PLOT-002
REVISION	
STATUS	
HORIZONTAL SCALE 1:800 VERTICAL SCALE 1:800	

mainroads WESTERN AUSTRALIA

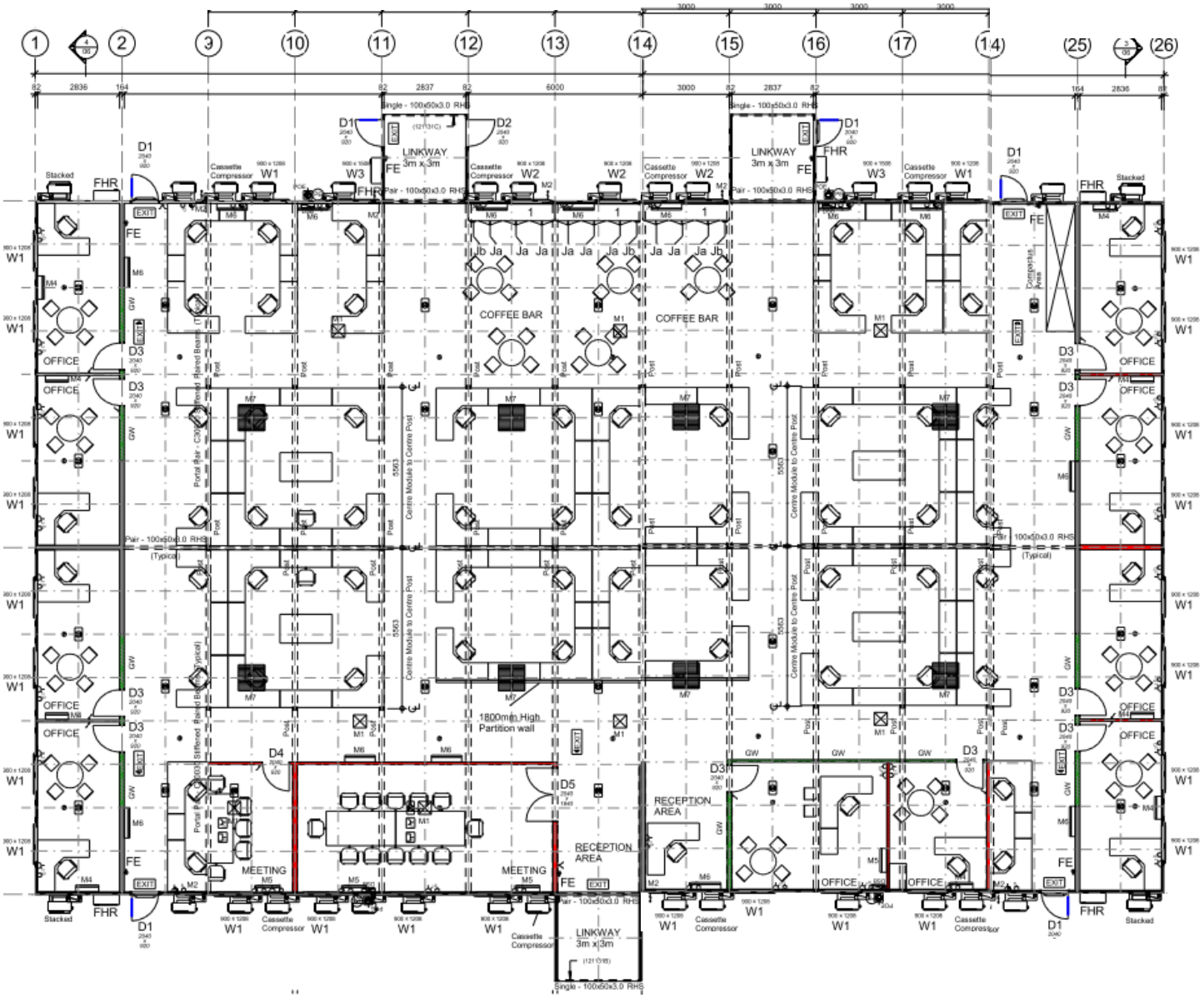
TONKIN EXTENSION ALLIANCE

Tonkin Extension Alliance

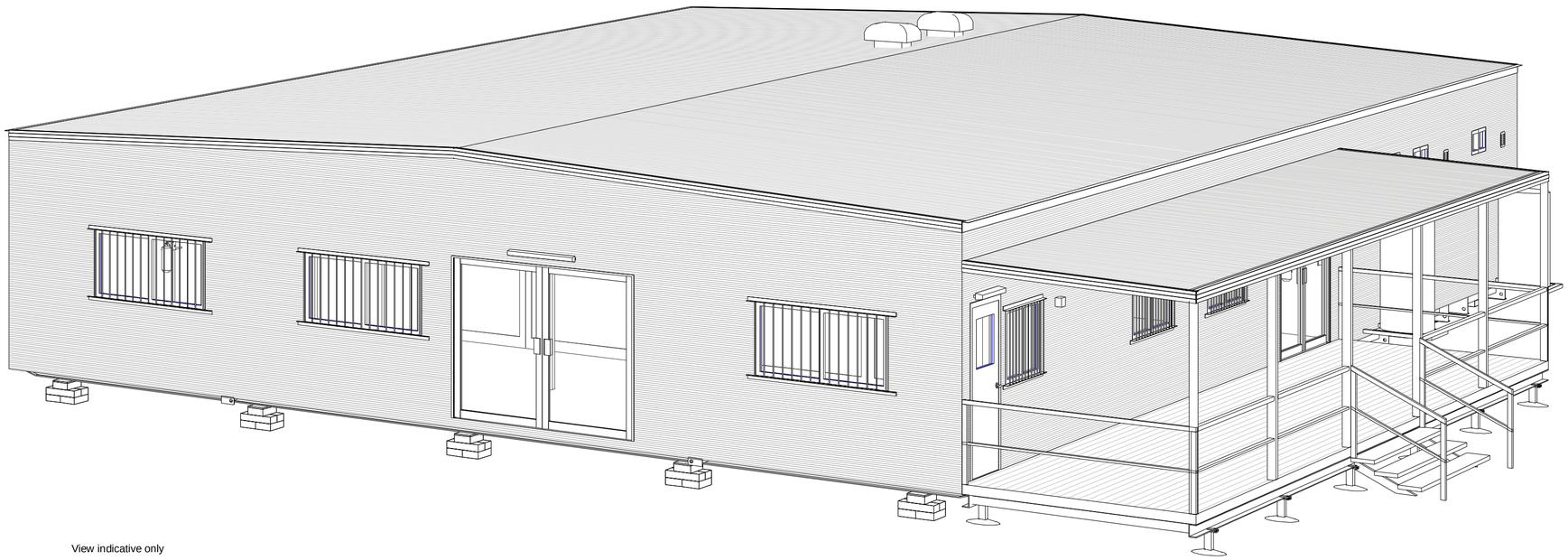
68 Hasler Road, Osborne Park WA 6017

Building 1

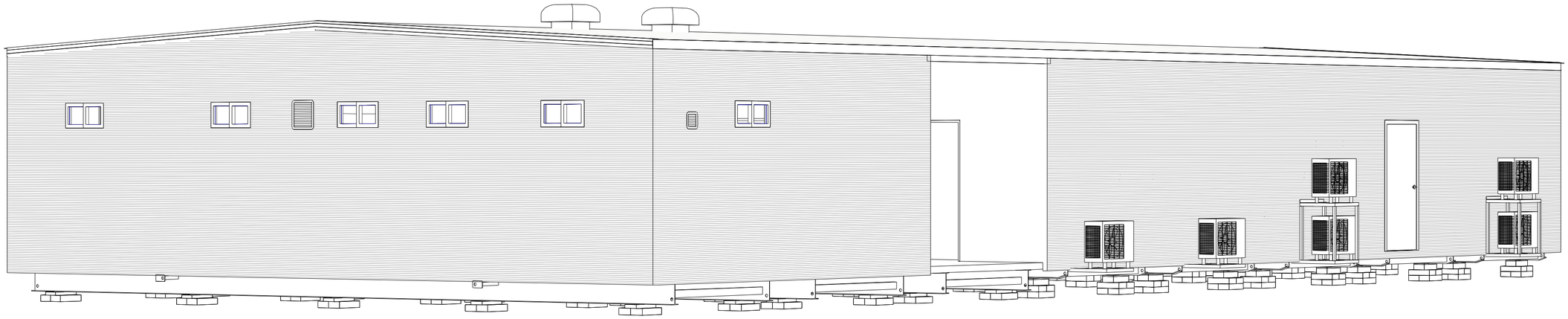
Site Office revised layout - Including 4no of additional modular units



Building 2



View indicative only



View indicative only

- Drawing List		
Sheet Number	**Sheet Name**	**Current Revision**
00	Title Page	A
01	Floor Plan	A
02	Elevations	A
03	Sectional View	A
05	Sales Schedules	A

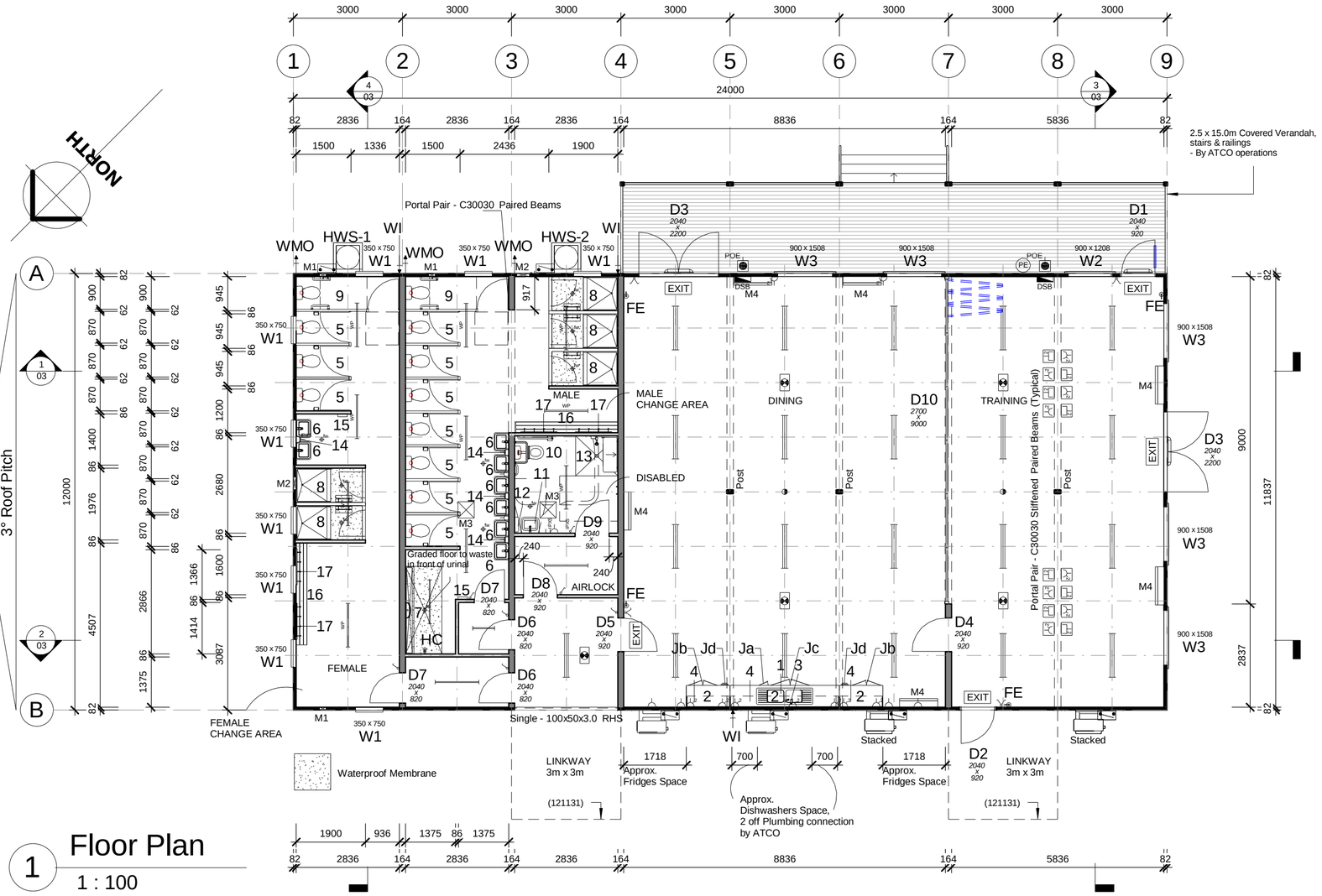
121131B

12.0 x 24.0m Office Complex

ATCO Structures & Logistics

ATCO STRUCTURES & LOGISTICS PTY. LTD.
115 Vulcan Road, Canning Vale WA 6155
PO Box 1757, Canning Vale DC, WA 6970
E-mail: atcowa@atcosl.com.au

PHONE: (08) 6252 6200
FAX: (08) 6252 6299
ABN: 71 083 902 309



1 Floor Plan

1 : 100

Item Lists

D1	2040 x 920 External Door -	Half Glass : Solid Core MC	
D2	2040 x 920 External Door -	Standard : Solid Core MC	
D3	6.38mm Grey Laminated Glass.	Double Shop Front Door	
D4	2040 x 920 Internal Door -	Standard : Hollow Core	
D5	2040 x 920 Internal Door -	Standard : Hollow Core	
D6	2040 x 820 Internal Door -	Standard : Hollow Core	
D7	2040 x 820 Internal Door -	Standard : Hollow Core	
D8	2040 x 920 Internal Door -	Standard : Hollow Core	
D9	2040 x 920 Internal Door -	Standard : Hollow Core	
D10	2700 x 9000 HUFCOR Operable Wall -		
W1	350 x 750	Sliding Glass Window	Laminated Obscure Glass
W2	900 x 1208	Sliding Glass Window -	Laminated Grey Glass
W3	900 x 1508	Sliding Glass Window	Laminated Grey Glass
M1	Wall Mounted Exhaust Fan		
M2	Wall Mounted Exhaust Fan - IPX5		
M3	Ceiling Mounted Exhaust Fan - IPX5 Rated		
M4	7.1kW R/C Split System Air Conditioner - Inverter		

Equipment Lists

1	1500x470 Std S/S twin sink & drainers
2	Benchtop - Laminated - 40mm - Straight - 600 Deep
3	ZIP Hydro Tap - BCH160/125+ (160 Cups/Hr) - 3l Tank
4	Melamine overhead cupboards
5	WC Cubicle c/w toilet roll holder
6	Hand Basin, Stainless Steel (Hot & cold flickmixer) w/ mirror
7	2400mm Wall mounted S/S urinal
8	Shower enclosure c/w bench seat & coat hooks
9	WC - Ambulant Side Inwards Entry Cubicle c/w Grabrails, Toilet Roll Holder & Coat Hook
10	Disabled WC Suite - 2011, Grab Rails & Backrest
11	Disabled Hand Basin - 2011 - c/w Oversized Mirror Over
12	Disabled Hand Basin Shelf
13	Disabled Shower Type II - 2011 - c/w Fold-Up Seat, Grab Rails & Coat Hooks
14	Wall mounted soap dispenser
15	Wall mounted paper towel dispenser
16	300mm Wide Timber slatted bench seat
17	Coat Hooks on Timber Rail
FE	9.0Kg Fire Extinguisher - AB(E)
fw	Floor Waste
HC	Hose Cock - Shrouded (Chrome)
HWS-1	250Ltr Hot water system - mounted externally
HWS-2	315Ltr Hot water system - mounted externally
Ja	Base Cabinet - 1 Door
Jb	Base Cabinet - 2 Door
Jc	Base Cabinet - 2 Door
Jd	Base Cabinet - 4 Drawer c/w cutlery insert

Notes

- Fire extinguishers, smoke detectors & fire hose reel / cabinets supplied & installed by ATCO. Additional fire fighting equipments supplied & installed by others.
- Any 3D views are to be regarded as indicative only.
- Draw Wires indicated for Data & Telecom - cable by others.
- HUFCOR Operable Wall - By ATCO operations.
- 2.5 x 15.0m Covered Verandah, stairs & railings are indicative only - By ATCO operations.

Symbol Legend

- Distribution Switchboard
- POE - Point Of Entry
- Light switch
- Two-way light switch
- Light switch - IPX5 rated
- Isolation Switch
- 10amp Single GPO
- 10amp Double GPO
- 15amp Single GPO.
- 10amp GPO - IPX5 rated
- 20amp Single GPO
- - Indicates recessed floor mounting
- - Indicates ceiling mounting
- Comms. - Draw wire only
- 'F' Type television outlet
- 240V Smoke detector
- 36w Single fluorescent light
- 36w Double fluorescent light
- 36w Emergency back-up fluorescent light
- 36w Single fluorescent light - IP65 rated
- Emergency exit light
- Oyster Light - 11W Round Fluro
- External light
- 18W Single Vandalite
- Oyster light
- Photo electric light switch
- Spot light
- PLUMBING - Water Inlet Point
- PLUMBING - Waste Manifold Outlet Point

Reg D Cat 2 STRUCTURAL NOTES - Min. Design Criteria Max. 3.0m wide

Dead and Live Windloads in accordance with the latest version of AS1170.2
Wind Region: D - Terrain Category: 2
Strength Design Wind Speed: Vu = 88m/s (86)
Serviceability Wind Speed: Vs = 57m/s (55)
Shielding Multiplier: 1.0 Topographic Multiplier: 1.0
Earthquake Loads in accordance with the latest version of AS1170.4
Table 2.1: Height <8.5m, Coefficient Kpz = 1.0
Table 3.1 Kp = 1.0
Table 3.2 Z = 0.12, W1 = 9000kg, U = 3, Ks=1.0
Table 5.4.2.3: F = Ks (Kpz Sp) W1, F = 3.6kN
U

FLOOR FRAME SPECIFICATION
Bearers: PFC 150/17 @ 2075mm centres.
Floor Joists: G550 - LC7512 @ 480 centres.

WALL FRAME SPECIFICATION
Stud Plate and Noggins: G550 - C7512 - 75 x 32 x 1.2mm Hi-Tensile steel building frame.
External Wall Studs @ 400 or 407mm centres. *(Sheet lining dictates)*..
All Welds in accordance with the latest version of AS1554.1.
Bracing as per ATCO Engineered Design Tables.
All openings (Styles and Heads) to wall frames to be as per noted:
1. 0 - 1220 = C7512 SBF
2. 1220 - 1820 = 75 x 50 x 2.0mm RHS
3. 1820 - 2420 = 75 x 50 x 2.5mm RHS
Refer to Shop Drawings for further detail.

Wall Frame Fixing Detail - FLOOR
Fix frames to floor system with #14 Tek Screws @ 407mm centres.
2 x fixings required to all external corners and beside every Door and Window aperture - Refer Shop Drawings.

Wall Frame Fixing Detail - ROOF
Fix frames to roof system with #14 Tek Screws @ 407mm centres.
2 x fixings required to all external corners and beside every Door and Window aperture - Refer Shop Drawings.

Welded Tabbing Detail
100 x 50 x 1.6mm Galvanised Plate welded to Wall Frame Bottom Plate and Floor Frame @ 814mm centres - Over Vertical Stud Frame Member.
100 x 50 x 1.6mm Galvanised Plate welded to Wall Frame Top Plate and Ceiling Frame @ 814mm centres - Over Vertical Stud Frame Member.

ROOF FRAME SPECIFICATION
Ceiling Joists: G550 - LC7512 (Single lip) @ 407mm centres
Noggins to be G550 - C7512 (2 rows)
All Welds in accordance with the latest version of AS1554.1.
Refer Shop Drawings for further detail.
Roofing Iron Purlins: G550 C7515 / LC7515
@ 900mm centres (end span) and 900mm centres (intermediate spans)

WINDOW SPECIFICATION
ULS (ULTIMATE) - 5.99kPA
SLS (SERVICEABILITY) - 1.82kPA
WATER PENETRATION - 450PA

ATCO STRUCTURES & LOGISTICS PTY. LTD.
115 Vulcan Road, Canning Vale WA 6155
PO Box 1757, Canning Vale DC, WA 6970
E-mail: atcowa@atcosl.com.au

PHONE: (08) 6252 6200
FAX: (08) 6252 6299

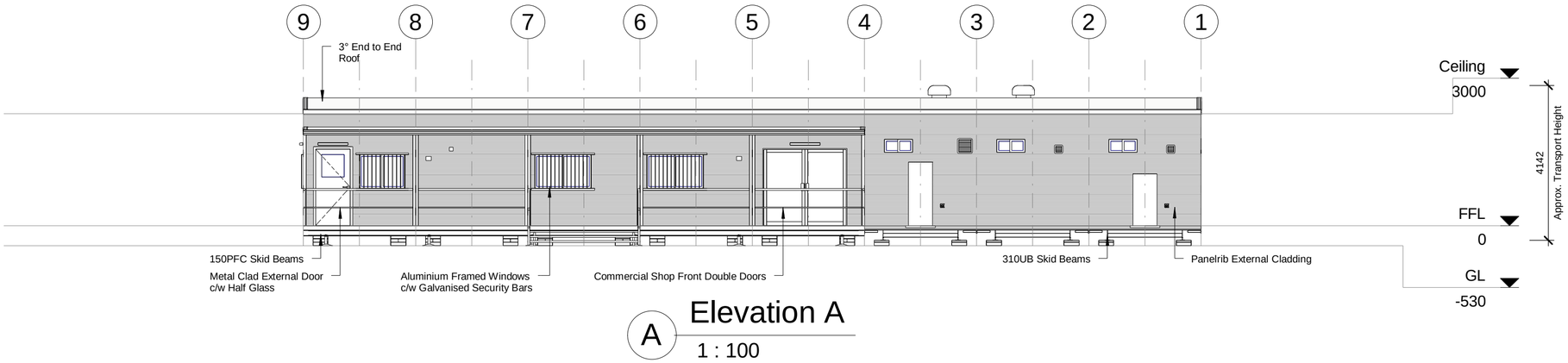
ABN: 71 083 902 309

Rev	Description	Date	By
	ISSUED FOR REVIEW	12.11.12	VT
A	Layout changed as per client, Added 1 off Male WC, 1 off Female WC, 1 off handbasin, 4 off soap dispenser, 2 off paper towel dispenser, 2 off bench seats & 4 off coat hooks on timber rails, Added laminated benchtop, cupboards, 4 drawers & melamine overhead cupboards, Added 1 off HUFCOR Operable Wall, Replaced wall MTD DBL GPO's/draw wires in Training area w/ 16 off recessed floor MTD DBL GPO's/draw wires, Replaced 1 off DBL Shop Front door w/ single door, Removed 1 off 900x1208 window.	07.01.13	VT

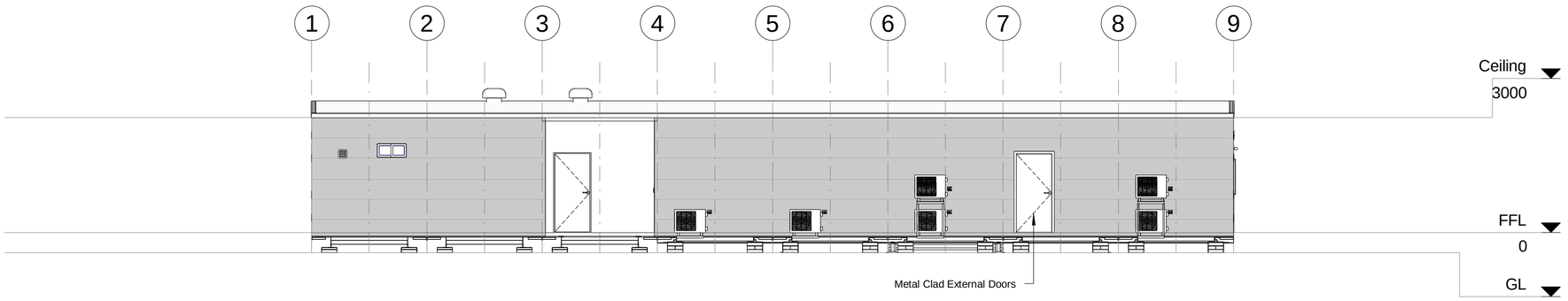
12.0 x 24.0m Office Complex

DATE	13.12.12
SCALE	1 : 100
DRAWN	VT
CHECKED	AS
PROJECT No.	
DESIGN WIND LOAD	Reg.D Cat.2
NCC BUILDING CLASS	5
TITLE	Floor Plan
DRAWING NUMBER	121131B -01
REVISION	A
SHEET SIZE	A2

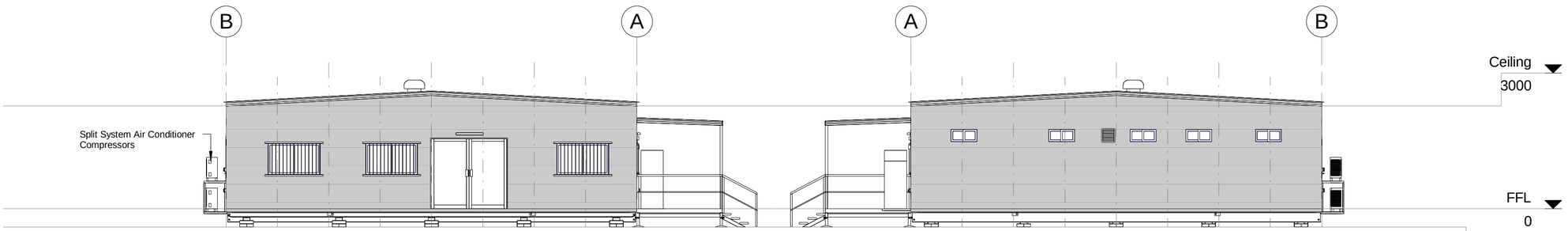
8/01/2013 5:35:18 PM



A Elevation A
1 : 100



B Elevation B
1 : 100



C Elevation C
1 : 100

D Elevation D
1 : 100

ATCO STRUCTURES & LOGISTICS PTY. LTD.
115 Vulcan Road, Canning Vale WA 6155
PO Box 1757, Canning Vale DC, WA 6970
E-mail: atcowa@atcosl.com.au

PHONE: (08) 6252 6200
FAX: (08) 6252 6299

ABN: 71 083 902 309

QUALITY CERTIFIED TO AS/NZS ISO 9001:2008
BY
SCI-QUAL INTERNATIONAL REGN No. 531

Rev	Description	Date	By
A	Layout changed as per client, Added 1 off Male WC, 1 off Female WC, 1 off handbasin, 4 off soap dispenser, 2 off paper towel dispenser, 2 off bench seats & 4 off coat hooks on timber rails, Added laminated benchtop, cupboards, 4 drawers & melamine overhead cupboards, Added 1 off HUFCOR Operable Wall, Replaced wall MTD DBL GPO's/draw wires in Training area w/ 16 off recessed floor MTD DBL GPO's/draw wires, Replaced 1 off DBL Shop Front door w/ single door, Removed 1 off 900x1208 window.	07.01.13	VT

12.0 x 24.0m Office Complex

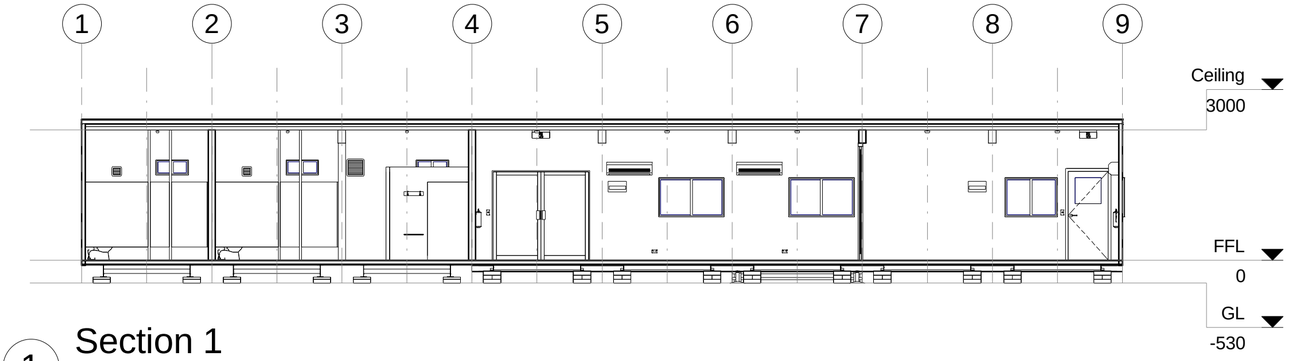
DATE	13.12.12
SCALE	1 : 100
DRAWN	VT
CHECKED	AS
PROJECT No.	

DESIGN WIND LOAD	NCC BUILDING CLASS
Reg.D Cat.2	5

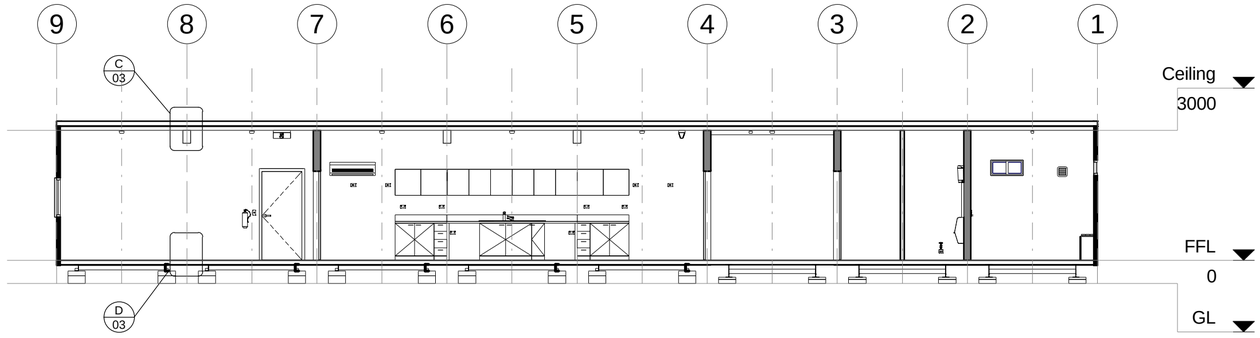
TITLE
Elevations

DRAWING NUMBER	REVISION	SHEET SIZE
121131B -02	A	A2

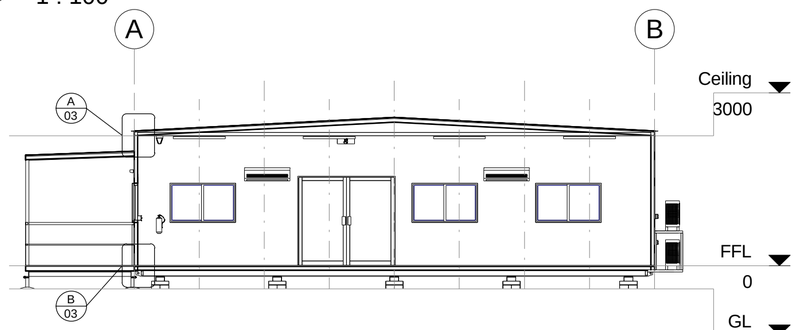
8/01/2013 5:35:21 PM



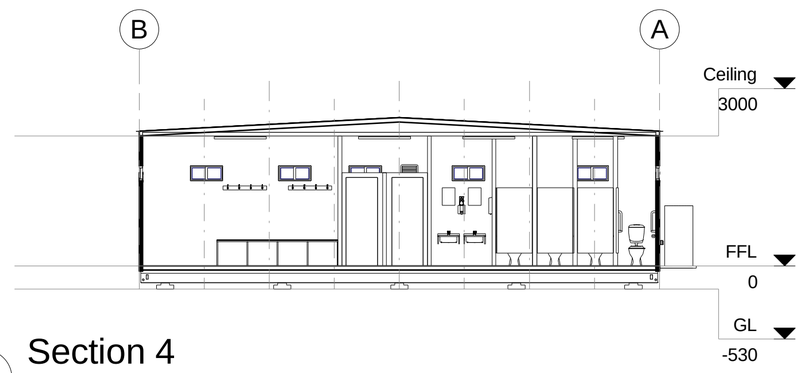
1 Section 1
1 : 100



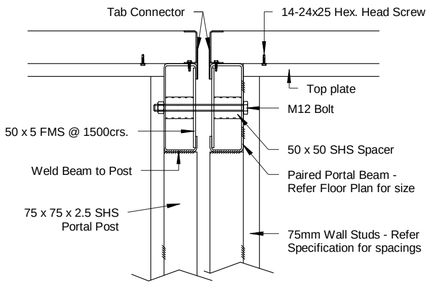
2 Section 2
1 : 100



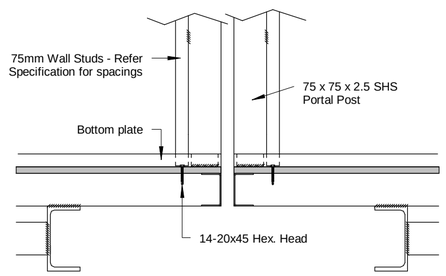
3 Section 3
1 : 100



4 Section 4
1 : 100

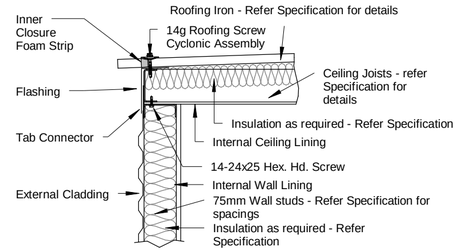


DETAIL C

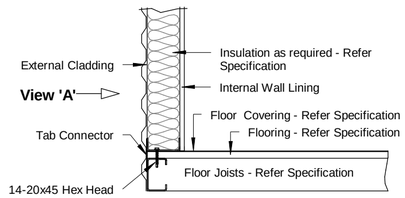


DETAIL D

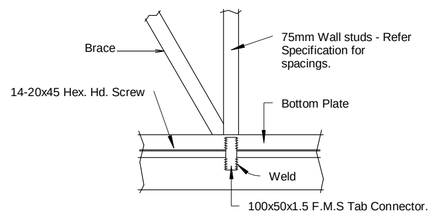
6 Complex Connection Details
1 : 10



DETAIL 'A' 1:10



DETAIL 'B' 1:10



VIEW 'A' 1:10

5 Connection Details
1 : 10

ATCO STRUCTURES & LOGISTICS PTY. LTD.
115 Vulcan Road, Canning Vale WA 6155
PO Box 1757, Canning Vale DC, WA 6970
E-mail: atcowa@atcosl.com.au

PHONE: (08) 6252 6200
FAX: (08) 6252 6299

ABN: 71 083 902 309

QUALITY CERTIFIED TO AS/NZS ISO 9001:2008
BY
SCI-QUAL INTERNATIONAL REGN No. 531

Rev	Description	Date	By
A	Layout changed as per client, Added 1 off Male WC, 1 off Female WC, 1 off handbasin, 4 off soap dispenser, 2 off paper towel dispenser, 2 off bench seats & 4 off coat hooks on timber rails, Added laminated benchtop, cupboards, 4 drawers & melamine overhead cupboards, Added 1 off HUFCOR Operable Wall, Replaced wall MTD DBL GPO's/draw wires in Training area w/ 16 off recessed floor MTD DBL GPO's/draw wires, Replaced 1 off DBL Shop Front door w/ single door, Removed 1 off 900x1208 window.	07.01.13	VT

12.0 x 24.0m Office Complex

DATE	13.12.12
SCALE	As indicated
DRAWN	VT
CHECKED	AS
PROJECT No.	
DESIGN WIND LOAD	Reg.D Cat.2
NCC BUILDING CLASS	5
TITLE	Sectional View
DRAWING NUMBER	121131B -03
REVISION	A
SHEET SIZE	A2

8/01/2013 5:35:23 PM

Manufacturing Structural Members		
Description	**Member Size**	**Back to Back**
Skid Beams c/w Retractable Lifters	150PFC	2000
Single Skid beams c/w Retractable lifters	310UB	2000
Paired Beams	Portal Pair - C30030	
Paired Beams	Portal Pair - C30030 Stiffened	
RHS	Single - 100x50x3.0	

- Floor Structure Schedule	
Floor Structure	**Comments**
Floor 480mm Floor Joist Centres	
Covering - 2.0mm Armstrong Armalon "PU" Coated Vinyl - "Neutral Grey"	100mm coved in wet areas only
Flooring - 15mm Compressed Fibre Cement (CFC) @ 400 ctrs.	Disabled WC area only
Flooring - 16.8mm F14 Plywood	
Graded floor to waste	As indicated, Disabled WC area
Insulation - Under Floor - 15mm Foilboard	
Joists - LC7512 Galvaspan	
Waterproof Membrane	As indicated

- Wall Schedule	
Wall Structure	**Comments**
External Wall 407mm Stud Centres	
Cladding - External - Maxirib - Horizontal	
Framing - 75 x 1.2mm Hi-Ten Truecore	
Insulation - R3.1 Batts - 75mm	
Lining - Internal - 3.6mm Polyester Coated Plywood	
Lining - Internal - 6mm Villaboard	Disabled WC area only
Thermal Break between Framing and Cladding	
Ply Internal Wall 611mm Stud Centres	
Framing - 75 x 1.2mm Hi-Ten Truecore	
Lining - Internal - 3.6mm Polyester Coated Plywood	

Sales Roof Structure Schedule	
Roof Structure	**Comments**
3° End to End Roof & Ridgecap Reg. D Cat. 2 - SDEK/PLY LC7512 - 407 - (3.0-3.5).. 407mm Ceiling Joist Centres	
Ceiling Joist - LC7512 Galvaspan	
Insulation - 100mm SUPATHERM Blanket	
Lining - Internal - 3.6mm Mirage Pearl Plywood	
Lining - Internal - 6mm Villaboard linings @ 400ctrs.	Disabled WC area only
Purlins - C7515 / LC7515 Galvaspan - 2 rows of nogs	
Roof - 0.48mm BMT Superdek Sheeting	

Notes

- Fire extinguishers, smoke detectors & fire hose reel / cabinets supplied & installed by ATCO. Additional fire fighting equipments supplied & installed by others.
- Any 3D views are to be regarded as indicative only.
- Draw Wires indicated for Data & Telecom - cable by others.
- HUFCOR Operable Wall - By ATCO operations.
- 2.5 x 15.0m Covered Verandah, stairs & railings are indicative only - By ATCO operations.

Sales Door Schedule													
No.	**Panel**	**Height**	**Width**	**Handle Type**	**Hardware Set**	**Closer**	**Panic Bar**	**Ali. Jamb**	**C/B Jamb**	**Timber Jamb**	**Security**	**Quantity**	**Comments**
D1	Half Glass : Solid Core MC	2040	920	Lever	Entrance	Yes	No	Yes				1	E/E seals & laminated grey glass
D2	Standard : Solid Core MC	2040	920	Lever	Entrance	Yes	No	Yes				1	E/E seals
D3	Double Shop Front Door	2040	2200	Push/Pull	Entrance	Yes		Yes				2	
D4	Standard : Hollow Core	2040	920	Lever	Passage	No	No		Yes	No		1	
D5	Standard : Hollow Core	2040	920	Lever	Entrance	Yes	No		Yes	No		1	
D6	Standard : Hollow Core	2040	820	Lever	Entrance	Yes	No		Yes	No		2	
D7	Standard : Hollow Core	2040	820	Lever	Passage	Yes	No		Yes	No		2	
D8	Standard : Hollow Core	2040	920	Lever	Passage	Yes	No		Yes	No		1	
D9	Standard : Hollow Core	2040	920	Lever	Privacy	Yes	No		Yes	No		1	
D10	HUFCOR Operable Wall	2700	9000	Latch	Passage							1	By ATCO operations

*** D1, D2 & D5 - To be master keyed.***

Wall Height
3000

Sales Window Schedule							
No.	**Type**	**Glazing**	**Height**	**Width**	**Sill Height**	**Quantity**	**Comments**
W1	Sliding XO..	Laminated Obscure Glass	350	750	1960	9	
W2	Sliding XO	Laminated Grey Glass	900	1208	1000	1	
W3	Sliding XO	Laminated Grey Glass	900	1508	1000	5	

- Security Features		
Description	**Size**	**Quantity**
Galvanised security bars	900 x 1200	1
Galvanised security bars	900 x 1500	5

* Plumbing Fixtures			
No.	**Description**	**Quantity**	**Comments**
1	1500x470 Std S/S twin sink & drainers	1	Hot & Cold
3	ZIP Hydro Tap - BCH160/125+ (160 Cups/Hr) - 3l Tank	1	
5	WC Cubicle c/w toilet roll holder	10	
6	Hand Basin, Stainless Steel (Hot & cold flickmixer) w/ mirror	8	Hot & Cold
7	2400mm Wall mounted S/S urinal	1	
8	Shower enclosure c/w bench seat & coat hooks	5	Hot & Cold
9	WC - Ambulant Side Inwards Entry Cubicle c/w Grabrails, Toilet Roll Holder & Coat Hook	2	
10	Disabled WC Suite - 2011, Grab Rails & Backrest	1	
11	Disabled Hand Basin - 2011 - c/w Oversized Mirror Over	1	Hot & Cold
12	Disabled Hand Basin Shelf	1	
13	Disabled Shower Type II - 2011 - c/w Fold-Up Seat, Grab Rails & Coat Hooks	1	Hot & Cold
14	Wall mounted soap dispenser	4	
15	Wall mounted paper towel dispenser	2	
fw	Floor Waste	10	
HC	Hose Cock - Shrouded (Chrome)	1	Cold Only
HWS-1	250Ltr Hot water system - mounted externally	1	
HWS-2	315Ltr Hot water system - mounted externally	1	
WI	Plumbing - Water Inlet	3	
WMO	Plumbing - Waste Manifold Outlet	3	

- Cupboards			
No.	**Description**	**Quantity**	**Comments**
2	Benchtop - Laminated - 40mm - Straight - 600 Deep	3	2 off 1200mm Long, 1 off 3000mm Long
4	Melamine overhead cupboards	3	2 off 1200mm Long, 1 off 3000mm Long
Ja	Base Cabinet - 1 Door	1	300mm Wide
Jb	Base Cabinet - 2 Door	2	900mm Long
Jc	Base Cabinet - 2 Door	1	1200mm Long
Jd	Base Cabinet - 4 Drawer c/w cutlery insert	2	300mm Wide

- Furniture			
No.	**Description**	**Quantity**	**Comments**
16	300mm Wide Timber slatted bench seat	2	2800mm Long
17	Coat Hooks on Timber Rail	4	1000mm Long

Sales Mechanical Equipment			
No.	**Supplier**	**Description**	**Quantity**
M1	AIRFLOW	Wall Mounted Exhaust Fan	3
M2	AIRFLOW	Wall Mounted Exhaust Fan - IPX5	2
M3	FANTECH	Ceiling Mounted Exhaust Fan - IPX5 Rated	2
M4	DAIKIN	7.1kW R/C Split System Air Conditioner - Inverter	6

- Electrical Fixtures	
Description	**Quantity**
1x10amp GPO	9
1x10amp GPO - IPX5 Rated	2
2x10amp GPO	9
2x10amp GPO - Recessed Floor Mounted	8
240v Smoke Alarm	2
Draw Wire - Double - Recessed Floor Mounted - RJ45 Cat 6	8
Isolation Switch - AC	6
Isolation Switch - HWS	2
Photo Electric Cell	1
Switchboard	2

Lighting Fixtures	Quantity
1x18W Fluro & Diffuser	1
1x36W Fluro & Diffuser	4
1x36W Fluro - IP65	9
2x36W Fluro & Diffuser	20
Backup Battery - Self Contained - LED	5
Exit - Ceiling Mount	4
Single Vandalite - Wall Mounted	3
Switch - 2 Way	4
Switch - IPX5	1
Switch - Std	6

- Fire Services Schedule		
No.	**Description**	**Quantity**
FE	9.0Kg Fire Extinguisher - AB(E)	4

ATCO Structures & Logistics

ATCO STRUCTURES & LOGISTICS PTY. LTD.
115 Vulcan Road, Canning Vale WA 6155
PO Box 1757, Canning Vale DC, WA 6970
E-mail: atcowa@atcosl.com.au

PHONE: (08) 6252 6200
FAX: (08) 6252 6299

ABN: 71 083 902 309

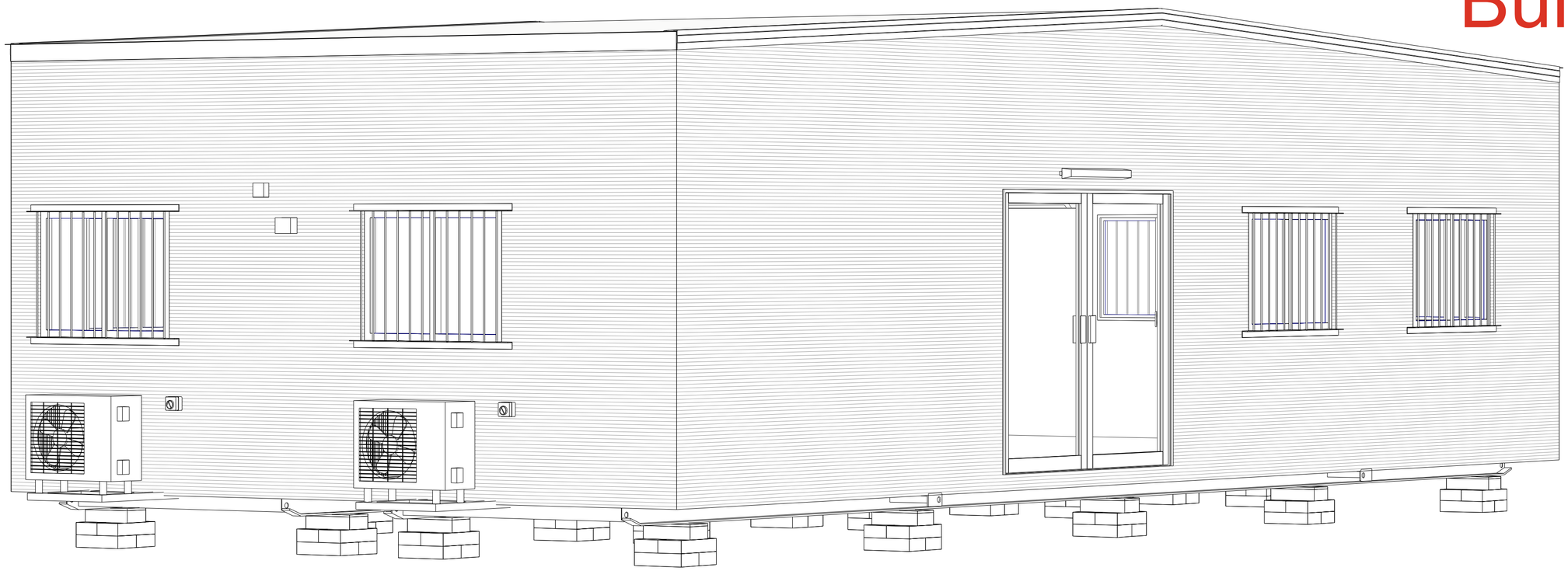
Rev	Description	Date	By
A	Layout changed as per client, Added 1 off Male WC, 1 off Female WC, 1 off handbasin, 4 off soap dispenser, 2 off paper towel dispenser, 2 off bench seats & 4 off coat hooks on timber rails, Added laminated benchtop, cupboards, 4 drawers & melamine overhead cupboards, Added 1 off HUFCOR Operable Wall, Replaced wall MTD DBL GPO's/draw wires in Training area w/ 16 off recessed floor MTD DBL GPO's/draw wires, Replaced 1 off DBL Shop Front door w/ single door, Removed 1 off 900x1208 window.	07.01.13	VT

12.0 x 24.0m Office Complex

DATE	13.12.12
SCALE	
DRAWN	VT
CHECKED	AS
PROJECT No.	
DESIGN WIND LOAD	Reg.D Cat.2
NCC BUILDING CLASS	5
TITLE	Sales Schedules
DRAWING NUMBER	121131B -05
REVISION	A
SHEET SIZE	A2

8/01/2013 5:35:27 PM

Building 3



View indicative only

- Drawing List		
Sheet Number	**Sheet Name**	**Current Revision**
00	Title Page	A
01	Floor Plan	A
02	Lighting Plan	A
03	Elevations	A
04	Sectional View	A
06	Sales Schedules	A

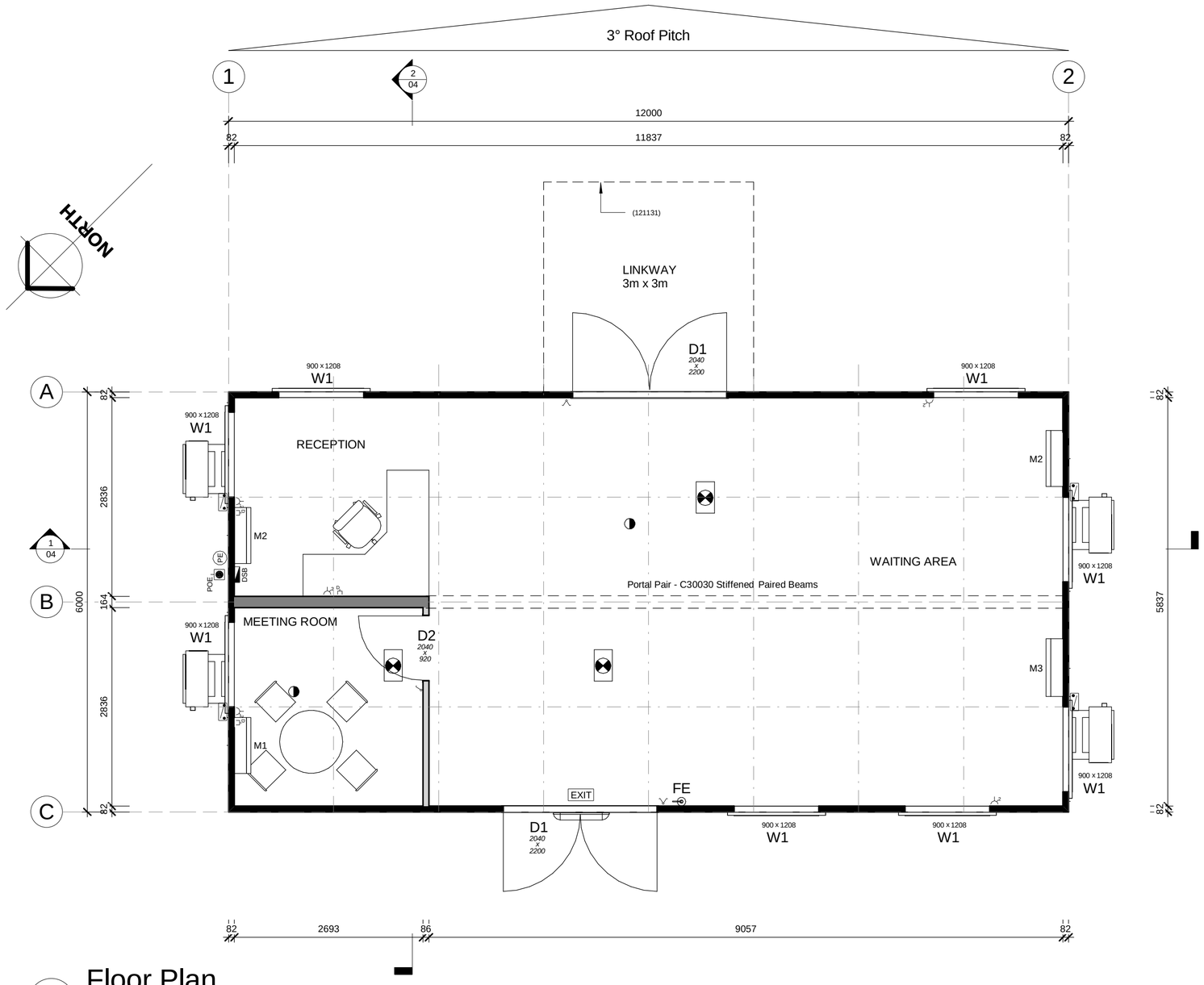
121131C

12.0 x 6.0m Office Complex

ATCO Structures & Logistics

ATCO STRUCTURES & LOGISTICS PTY. LTD.
115 Vulcan Road, Canning Vale WA 6155
PO Box 1757, Canning Vale DC, WA 6970
E-mail: atcowa@atcosl.com.au

PHONE: (08) 6252 6200
FAX: (08) 6252 6299
ABN: 71 083 902 309



1 Floor Plan

1 : 50

Item Lists

D1	6.38mm Grey Laminated Glass.	Double Shop Front Door
D2	2040 x 920 Internal Door -	Standard : Hollow Core
W1	900 x 1208 Sliding Glass Window -	Laminated Grey Glass
M1	2.5kW R/C Split System Air Conditioner - Hybrid - Inverter	
M2	3.5kW R/C Split System Air Conditioner - Hybrid - Inverter	
M3	5.0kW R/C Split System Air Conditioner - Inverter	

Equipment Lists

FE	9.0Kg Fire Extinguisher - AB(E)

Reg D Cat 2 STRUCTURAL NOTES - Min. Design Criteria Max. 3.0m wide

Dead and Live Windloads in accordance with the latest version of AS1170.2
Wind Region: D - Terrain Category: 2
Strength Design Wind Speed: Vu = 88m/s (86)
Serviceability Wind Speed: Vs = 57m/s (55)
Shielding Multiplier: 1.0 Topographic Multiplier: 1.0
Earthquake Loads in accordance with the latest version of AS1170.4
Table 2.1: Height <8.5m, Coefficient Kpz = 1.0
Table 3.1 Kp = 1.0
Table 3.2 Z = 0.12, W1 = 9000kg, U = 3, Ks=1.0
Table 5.4.2.3: F = Ks (KpZ Sp) W1, F = 3.6kN
U

FLOOR FRAME SPECIFICATION
Bearers: PFC 150/17 @ 2075mm centres.
Floor Joists: G550 - LC7512 @ 480 centres.

WALL FRAME SPECIFICATION
Stud Plate and Noggins: G550 - C7512 - 75 x 32 x 1.2mm Hi-Tensile steel building frame.
External Wall Studs @ 400 or 407mm centres. *(Sheet lining dictates)*..
All Welds in accordance with the latest version of AS1554.1.
Bracing as per ATCO Engineered Design Tables.
All openings (Styles and Heads) to wall frames to be as per noted:
1. 0 - 1220 = C7512 SBF
2. 1220 - 1820 = 75 x 50 x 2.0mm RHS
3. 1820 - 2420 = 75 x 50 x 2.5mm RHS
Refer to Shop Drawings for further detail.

Wall Frame Fixing Detail - FLOOR
Fix frames to floor system with #14 Tek Screws @ 407mm centres.
2 x fixings required to all external corners and beside every Door and Window aperture - Refer Shop Drawings.

Wall Frame Fixing Detail - ROOF
Fix frames to roof system with #14 Tek Screws @ 407mm centres.
2 x fixings required to all external corners and beside every Door and Window aperture - Refer Shop Drawings.

Welded Tabbing Detail
100 x 50 x 1.6mm Galvanised Plate welded to Wall Frame Bottom Plate and Floor Frame @ 814mm centres - Over Vertical Stud Frame Member.
100 x 50 x 1.6mm Galvanised Plate welded to Wall Frame Top Plate and Ceiling Frame @ 814mm centres - Over Vertical Stud Frame Member.

ROOF FRAME SPECIFICATION
Ceiling Joists: G550 - LC7512 (Single lip) @ 407mm centres
Noggins to be G550 - C7512 (2 rows)
All Welds in accordance with the latest version of AS1554.1.
Refer Shop Drawings for further detail.
Roofing Iron Purlins: G550 C7515 / LC7515
@ 900mm centres (end span) and 900mm centres (intermediate spans)

WINDOW SPECIFICATION
ULS (ULTIMATE) - 5.99kPA
SLS (SERVICEABILITY) - 1.82kPA
WATER PENETRATION - 450PA

Notes

- Fire extinguishers & fire hose reel / cabinets supplied & installed by ATCO. Additional fire fighting equipments supplied & installed by others.
- Any 3D views are to be regarded as indicative only.
- Furniture supplied & installed by others. Furniture layout as per client.
- Glass walls (Glazed - 2.7m High) - By ATCO operations.
- Floor covering (Carpet Tiles) supplied & installed by client.
- Suspended ceiling 1200 x 600 Tiles shown in "Lighting Plan" are indicative only, supplied & installed by client.
- Fluorescent Troffer type lights (1200x300) shown in "Lighting Plan" are indicative only, supplied & installed by client. Wiring allowed by ATCO.
- Smoke detectors are indicative only supplied & installed by client. Wiring allowed by ATCO.
- Draw Wires indicated for Data & Telecom - cable by others.

Symbol Legend

DSB	Distribution Switchboard		Comms. - Draw wire only
	POE - Point Of Entry		'F' Type television outlet
	Light switch		240V Smoke detector
	Two-way light switch		36w Single fluorescent light
IPX5	Light switch - IPX5 rated		36w Double fluorescent light
	Isolation Switch		36w Emergency back-up fluorescent light
		WP	36w Single fluorescent light - IP65 rated
	10amp Single GPO	EXIT	Emergency exit light
2	10amp Double GPO		Oyster Light - 11W Round Fluro
	15amp Single GPO.		External light
IPX5	10amp GPO - IPX5 rated		18W Single Vandalite
	20amp Single GPO		Oyster light
	- Indicates recessed floor mounting	PE	Photo electric light switch
	- Indicates ceiling mounting		Spot light
			PLUMBING - Water Inlet Point
			PLUMBING - Waste Manifold Outlet Point

ATCO STRUCTURES & LOGISTICS PTY. LTD.
115 Vulcan Road, Canning Vale WA 6155
PO Box 1757, Canning Vale DC, WA 6970
E-mail: atcowa@atcosl.com.au

PHONE: (08) 6252 6200
FAX: (08) 6252 6299

ABN: 71 083 902 309

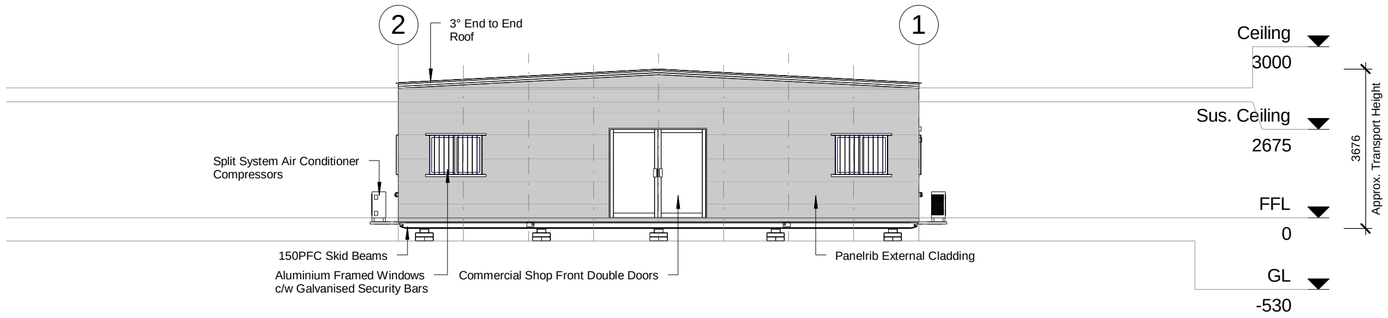
QUALITY CERTIFIED TO AS/NZS ISO 9001:2008
BY
SCI-QUAL INTERNATIONAL REGN No. 531

Rev	Description	Date	By
A	Layout changed as per client, Added 1 off 2x10amp GPO & 1 off draw wire.	07.01.13	VT

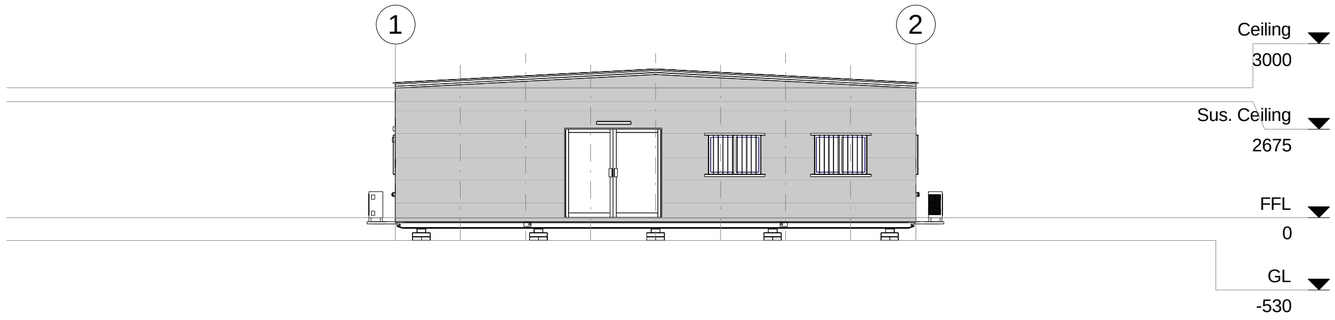
12.0 x 6.0m Office Complex

DATE	13.12.12
SCALE	1 : 50
DRAWN	VT
CHECKED	AS
PROJECT No.	
DESIGN WIND LOAD	Reg.D Cat.2
NCC BUILDING CLASS	5
TITLE	Floor Plan
DRAWING NUMBER	121131C -01
REVISION	A
SHEET SIZE	A2

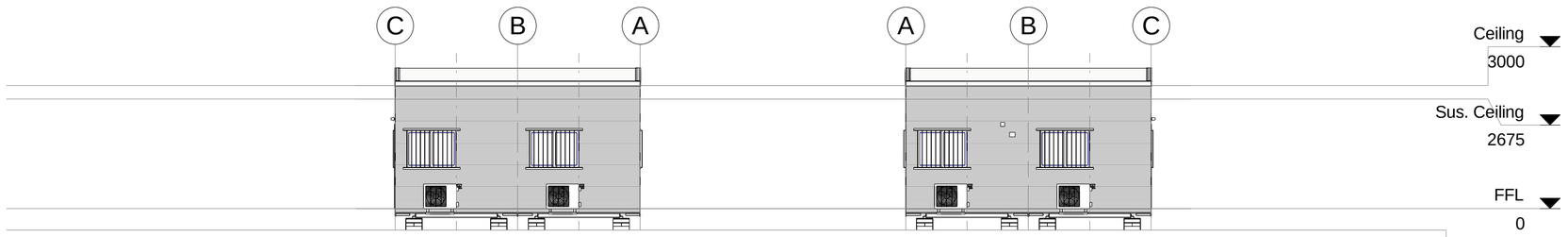
8/01/2013 5:27:12 PM



A Elevation A
1 : 100



B Elevation B
1 : 100



C Elevation C
1 : 100

D Elevation D
1 : 100

ATCO STRUCTURES & LOGISTICS PTY. LTD.
115 Vulcan Road, Canning Vale WA 6155
PO Box 1757, Canning Vale DC, WA 6970
E-mail: atcowa@atcosl.com.au

PHONE: (08) 6252 6200
FAX: (08) 6252 6299

ABN: 71 083 902 309

QUALITY CERTIFIED TO AS/NZS ISO 9001:2008
BY
SCI-QUAL INTERNATIONAL REGN No. 531

Rev	Description	Date	By
A	Layout changed as per client, Added 1 off 2x10amp GPO & 1 off draw wire.	07.01.13	VT

12.0 x 6.0m Office Complex

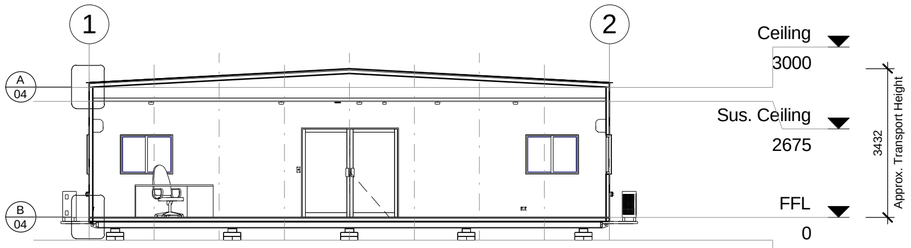
DATE	13.12.12
SCALE	1 : 100
DRAWN	VT
CHECKED	AS
PROJECT No.	

DESIGN WIND LOAD	NCC BUILDING CLASS
Reg.D Cat.2	5

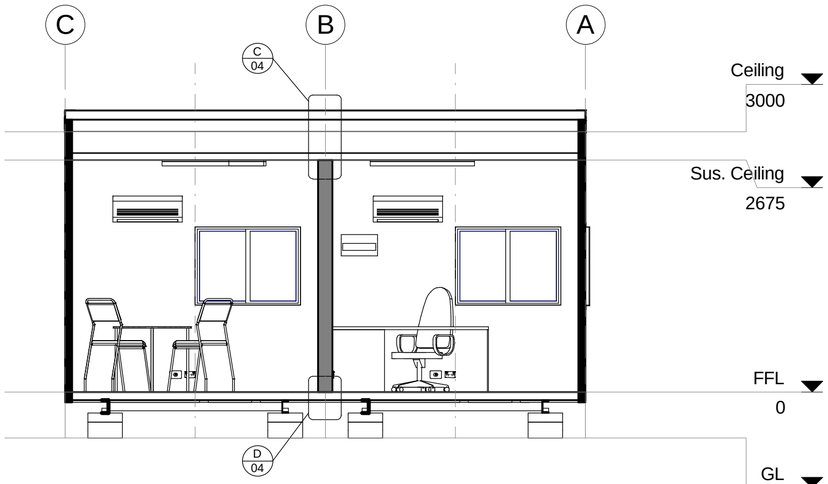
TITLE
Elevations

DRAWING NUMBER	REVISION	SHEET SIZE
121131C -03	A	A2

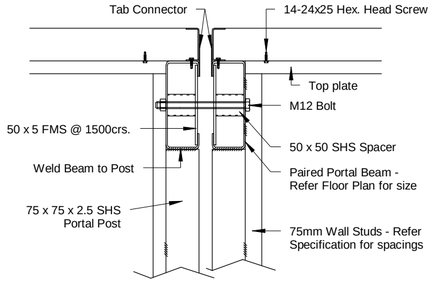
8/01/2013 5:27:13 PM



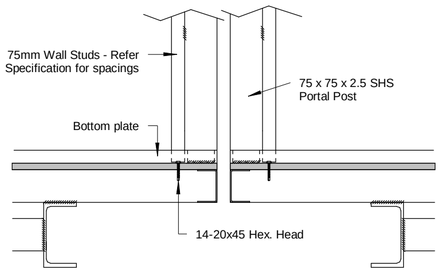
1 Section 1
1 : 100



2 Section 2
1 : 50

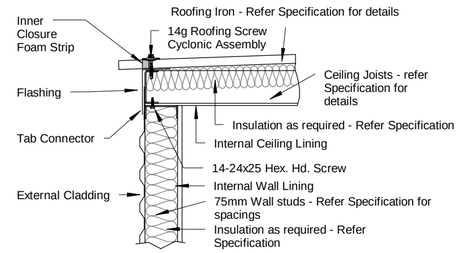


DETAIL C

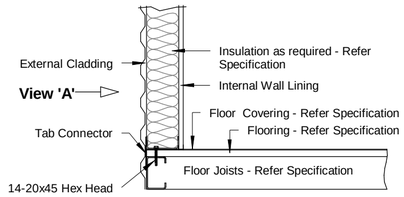


DETAIL D

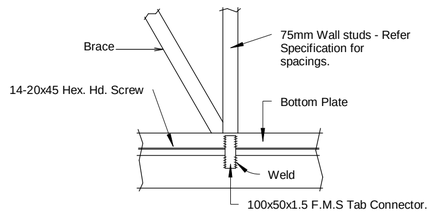
4 Complex Connection Details
1 : 10



DETAIL 'A' 1:10



DETAIL 'B' 1:10



VIEW 'A' 1:10

3 Connection Details
1 : 10

ATCO STRUCTURES & LOGISTICS PTY. LTD.
115 Vulcan Road, Canning Vale WA 6155
PO Box 1757, Canning Vale DC, WA 6970
E-mail: atcowa@atcosl.com.au

PHONE: (08) 6252 6200
FAX: (08) 6252 6299

ABN: 71 083 902 309

QUALITY CERTIFIED TO AS/NZS ISO 9001:2008
BY
SCI-QUAL INTERNATIONAL REGN No. 531

Rev	Description	Date	By
A	Layout changed as per client, Added 1 off 2x10amp GPO & 1 off draw wire.	07.01.13	VT

12.0 x 6.0m Office Complex

DATE	13.12.12
SCALE	As indicated
DRAWN	VT
CHECKED	AS
PROJECT No.	
DESIGN WIND LOAD: Reg.D Cat.2	NCC BUILDING CLASS: 5
TITLE: Sectional View	
DRAWING NUMBER: 121131C -04	REVISION: A / SHEET SIZE: A2

8/01/2013 5:27:15 PM

Suite 10/2 Hardy St
South Perth WA 6151
PO Box 111 South Perth WA 6951
E admin@strada-rpc.com

TRANSPORT IMPACT ASSESSMENT

Tonkin Extension Alliance

Temporary Project Site Office

LOCATION: Kargotich Road, Oakford

CLIENT: Tonkin Extension Alliance

AUTHOR: David Taylor

SIGNATURE: 

DATE: 12.05.2025

DOCUMENT NO: TIA- TEA-0001

REVISION: B

Revision Register

Revision	Date	Revision Description	Issued By	Reviewed By	Signature
B	12/05/2025	For Client Review	David Taylor	Travis Green	

Contents

GLOSSARY

Term	Definition
APT	Alliance Project Team
CAH	Controlled Access Highway
CAR	Corrective Action Report
FWY	Freeway
HVO	Heavy Vehicle Operations
HVS	Heavy Vehicle Services
HWY	Highway
LGA	Local Government Authority
MRWA	Main Roads Western Australia
OMTID	Office of Major Infrastructure Delivery
RAV	Restricted Access Vehicle
RNOC	Road Network Operations Centre
RSA	Road Safety Audit(or)
SCATS	Sydney Co-ordinated Adaptive Traffic System
SIDRA	Signalised and un-signalised Intersection Design and Research Aid
SSJ	Shire of Serpentine – Jarrahdale
TEA	Tonkin Extension Alliance
TIA	Traffic Impact Assessment
VPD	Vehicles Per Day
VPLPH	Vehicles Per Lane Per Hour
VPH	Vehicles Per Hour

1 SUMMARY

This Traffic Impact Assessment (TIA) has been prepared by Strada Consultants Pty Ltd on behalf of the Tonkin Extension Alliance for the development of the Project site office for the concurrent Thomas Road Upgrade Project and the Tonkin Highway Extension Project. The proposed location for the Project site office is located at Lot 1780 Thomas Road, Oakford with the development access adjoining Kargotich Road, Oakford.

At the time of preparing this document, Kargotich Road is closed between Thomas Road and Orton Road for the upgrade of Kargotich Road and the construction of a Service Station adjacent to the proposed Project site office lot.

The subject site is located along Kargotich Road between Thomas Road and Greyman Street, more specifically Kargotich Road SLK3.45 – SLK3.55. The subject site is currently vacant land. Access to the subject site is proposed to be via three crossover locations, the southernmost being the general vehicle entry (only) to the Project site office carpark and the entry at the northern end of the car park will service exit (only). The third crossover is the northern most and will be used for the service driveway to accommodate movements up to 19m in length prime mover and semi-trailer. The permitted movements at these driveways have been designed, where possible, eliminate uncontrolled right turn movements. Swept path analysis has been prepared for each crossover with the specific design vehicle for each crossover.

In accordance with the WAPC document “Transport Impact Assessment Guidelines, Volume 4 – Individual Developments (2016)”, a TIA is required for developments that are likely to generate more than 100 vehicles per hour. The site office carpark has been designed to accommodate over 180 vehicles and due to the nature of the Project site office opening and closure times, it is likely that the Project will generate over 100 vehicles per hour during start of business and close of business. A TIA is warranted on that basis.

The aim of this TIA is to ascertain the traffic impact of the development proposal by estimating the traffic movement demand generated by the development proposal and how the generation of additional movements are distributed on the adjoining road network.

The traffic modelling and analysis undertaken in this report demonstrates a satisfactory level of service to the immediate and adjoining road network for the proposed development crossovers.

2 INTRODUCTION AND BACKGROUND.

2.1 Introduction

The Tonkin Extension Alliance has been awarded by the Office of Major Transport Infrastructure Delivery (OMTID) the delivery of the Tonkin Highway Extension and Thomas Road Upgrade Project, contract number 179/18. The Project scope is to extend Tonkin Highway beyond Thomas Road through to South Western Highway as well as upgrade Thomas Road to a dual carriageway between Kargotich Road to the west and to Alexander Road to the east. Thomas Road Thomas Road to South Western Highway, Contract number 179/18.
The Alliance Project Team (APT), comprises BMD, Civcon Civil and Project Management, Georgiou Group, BG&E, and GHD and Main Roads WA personnel. The Alliance Project Team requires a suitable site office in close proximity to the Project during the delivery of the Project.

2.2 Background

The south-east corridor is an important and fast-growing area. Byford, Armadale, Kelmscott and Gosnells are faced with large volumes of heavy vehicles and other through traffic travelling to and from the South West and Wheatbelt regions.

The extension of Tonkin Highway will reduce traffic pressure and travel time for private and freight traffic, improve road connectivity between current and future residential, business and employment precincts, and improve safety.

The Tonkin Highway Extension project comprises of:

- A 14km extension of Tonkin Highway from Thomas Road to South Western Highway as a four-lane dual carriageway.
- Principal Shared Path (PSP) on the eastern side of the Tonkin Highway extension for the full 14km length, including:
- Connections to Thomas Road, Orton Road, Bishop Road, Mundijong Road and South Western Highway
    - Five underpasses at two grade separation locations (Thomas Road and Bishop Road)
    - Footbridge overpass at Orton Road (east of the highway alignment)
    - Local road connections (Copper Road and Adamson Street)
- Grade separated interchange at Bishop Road
- Roundabouts on Tonkin Highway at Orton Road, Mundijong Road and South Western Highway
- Underpasses at Abernethy Road (road, pedestrian, cyclist and equine), Gossage Road (pedestrian, cyclist and equine) and Shanley Road (road, pedestrian, cyclist and equine)
- Roundabouts at Hopkinson Road/Abernethy Road, and Shanley Road/Jarrahdale Road/South Western Highway
- Bridges over rail at Bishop Road (as part of interchange over the freight rail) and Wright Road (over road and rail)
- Noise and amenity (visual screening) walls
- Lighting for the main roads and the PSP throughout project
- Access and connectivity improvements to local roads including fire and emergency egress where required

Tonkin Highway will be a dual carriageway with two lanes in each direction, and a posted speed of 100km/h between intersections.

The Thomas Road Upgrade Project will complement the Tonkin Highway Extension Project, and comprises of:

- Widen and duplicate 4.5km of Thomas Road between Kargotich Road and South Western Highway (the section from Thomas Road over Rail to South Western Highway has already been upgraded as part of the METRONET Project).
- Construction of a new grade separated interchange at Thomas Road and Tonkin Highway. This will allow traffic to move freely on Tonkin Highway and provide improved capacity for Thomas Road traffic.
- Construction of 4.5km of new shared path on the south side of Thomas Road.
- Provision of a new signalised equine crossing to connect Byford and Darling Downs bridle paths.
- Local intersection upgrades and changes including:
    - Ballak Place: Left in left out only. Improvement to include left turn deceleration lane
    - Hopkinson Road (north of Thomas Road): Cul de sac
    - Kardan Boulevard: new roundabout
    - Hopkinson Road (south of Thomas Road): Cul de sac
    - Masters Road / Malarkey Road: new roundabout
    - Briggs Road: Left in left out access only
    - Plaistowe Boulevard: New traffic signals to improve access for general traffic and buses
    - Wungong South Road: Reconstruct to an improved priority controlled intersection
- Equine path network north of Thomas Road: realigned to maintain connectivity and accommodate road widening.
- Amenity (visual screening) walls and noise barriers.
- Lighting for the length of Thomas Road upgrades.

Thomas Road will be upgraded to a dual carriageway with two lanes in each direction, and a posted speed of 70km/h.

The Tonkin Highway Extension and Thomas Road Upgrade are being delivered together due to the timing of development and delivery, overlap of stakeholders and geographical location. Figure 1 below provides a visual representation of the size and general scope of The Project.

Figure 1: The Project map

3 EXISTING ROAD ENVIRONMENT

3.1 Adjacent Affected Roads.

With respect to the site office proposal, as opposed to the impact of The Project at large, the existing impacted roads include:

Kargotich Road -

Kargotich Road is a single lane each way carriageway with narrow unsealed shoulders. Kargotich Road is classified in the MRWA road hierarchy as a regional distributor with a posted speed limit that ranges from 70km/h to 90km/h within the vicinity of the development proposal. The speed limit reduces from 90km/h to 70km/h as Kargotich Road approaches the Thomas Road roundabout intersection.

Figure 2: Northbound view along Kargotich Road (temporary roadwork signage no longer in place)

A combination of the latest traffic data available from MRWA and the SSJ indicates the am peak Monday to Friday traffic demand occurs between 07:00 and 08:00 with a combined peak demand of 545v/h (392v/h NB and 151v/h SB). The PM peak occurs between 16:00 and 17:00 with a combined peak demand of 650v/h (193v/h NB and 457v/h SB). This tends to align generally with the more recent vehicle data supplied by SSJ with a combined AM peak typically around 550v/h and 620v/h. The SSJ data was collected from an older time and whilst showing similar demands, is slightly lower not accounting for some additional developments along Kargotich Road.

Kargotcih Road forms part of the Category 1-3 Restricted Access Vehicle (RAV) road network – with conditions, able to accommodate vehicle configurations up to 27.5m in length. The heavy vehicle portion of traffic volume consists on average of 26.4% of the total traffic volume. The traffic data more recently supplied by SSJ indicates a lesser heavy vehicle usage on average around 16.5%, however, this may have also been attributed to the intersection construction works at the Thomas Road and Kargotich Road intersection occurring at the time of the traffic data collection.

Speed compliance is consistent between both the MRWA and SSJ traffic data generally indicating that 85%ile of traffic travel at approximately 10% over the posted 90km/h speed limit in both directions at the midblock locations.

Thomas Road -
Thomas Road is a single lane each way carriageway with sealed shoulders (EB – 2.0m, WB – 1.0m). Thomas Road Is a primary distributor road with a posted speed limit that ranges from 70km/h to 80km/h in the vicinity of the affected road network. With respect to the project development, the applicable approach speed is 70km/h to the Thomas Road and Kargotich Road roundabout intersection.
The intersection of Thomas Road and Kargotich Road has recently been upgraded from a T-intersection to a two lane roundabout. Whilst all approaches are single lane carriageways, the east and west bound carriageways on Thomas Road widen to a two lane approach and departure to the intersection. The southern approach of Kargotich Road, widens also to a two lane approach with a dedicated left turn lane and straight and right turn movement. The northern approach, being of low traffic demand maintains a single lane approach.
Thomas Road has a combined weekday AM peak of 910 v/h between 07:00 and 08:00 (485v/h EB and 425v/h WB). The weekday combined PM peak is around 1289v/h between 16:00 and 17:00 (483v/h EB and 806v/h WB).
Thomas Road forms part of Category 7 RAV road network and heavy vehicle over size over mass (OSOM) network. The heavy vehicle percentage composition on Thomas Road on average is 14.1% but gets as high as 27.2% during weekday business activity.
The speed compliance for Thomas Road midblock indicates on average an 85%ile of 72km/h in the 70km/h posted zone. The speed compliance at the Thomas Road and Kargotich Road intersection is less than the posted speed limit as is the nature of the speed reduction on approach to a large dual lane roundabout controlled intersection through the use of horizontal curvature on approach (predeflection).

Figure 3: Westbound view along Thomas Road on approach to Kargotich Road

Figure 4: Eastbound view along Thomas Road (midblock)

Tonkin Highway -
Tonkin Highway is two lane each way dual carriageway. Tonkin Highway is classified in the MRWA road hierarchy as a primary distributor road with a posted speed limit that ranges from 70km/h (at signalised intersections) to 100km/h at midblock locations.

Figure 5: Southbound view along Tonkin Highway on approach to Thomas Road

Figure 6: Northbound view along Tonkin Highway (midblock)

The Tonkin Highway and Thomas Road intersection is currently a signal controlled intersection with two through lanes on the eastbound approach accompanied by a third left turn lane with give way control, three lanes on the westbound approach (share straight and right middle lane) and three lane approach on the south bound approach (dual right turn and "giveway" control for the single left turn. The daily total vehicle demand for Tonkin highway is over 28,000 v/d. The typical weekday combined AM peak for Tonkin Highway is 1990v/h (1428v/h NB and 562v/h SB). The typical weekday combined PM peak for Tonkin Highway is 2717v/h (856v/h NB and 1861v/h SB). Tonkin Highway forms part of the Network 7 RAV route and OSOM network. The average weekday heavy vehicle composition for Tonkin Highway is 9.0%, which despite being a significant arterial movement for the heavy vehicle network, is diluted due to the high vehicle demand of light vehicles. The speed compliance for Tonkin Highway midblock indicates on average an 85%ile of 105.5km/h in the 100km/h posted zone.

Greyman Street -

Greyman Street is a single lane each way local access road with no posted speed limit. This indicates that the maximum speed limit is 110km/h, however, given the semi built up nature of the area, it is unlikely that this speed would be adopted by road users. Greyman Street typically is absent of kerbing and line marking except at intersections with other roads. Greyman Street has a sealed surface width of 6m.

Abernethy Road -

Abernethy Road is a single lane each way carriageway. Abernethy Road is categorized as a local access road with a posted speed of 70km/h east of Kargotich Road and a speed limit of 70km/h in the vicinity of Kargotich Road to the west that increases to 90km/h at the midblock location. Abernethy Road has limited pavement marking and generally unkerbed shoulders generally at midblock locations. Typically, the road is kerbed with pre-deflection islands on approach to Kargotich Road from both directions.

Figure 7: Eastbound view along Abernethy Road west of Kargotich Road

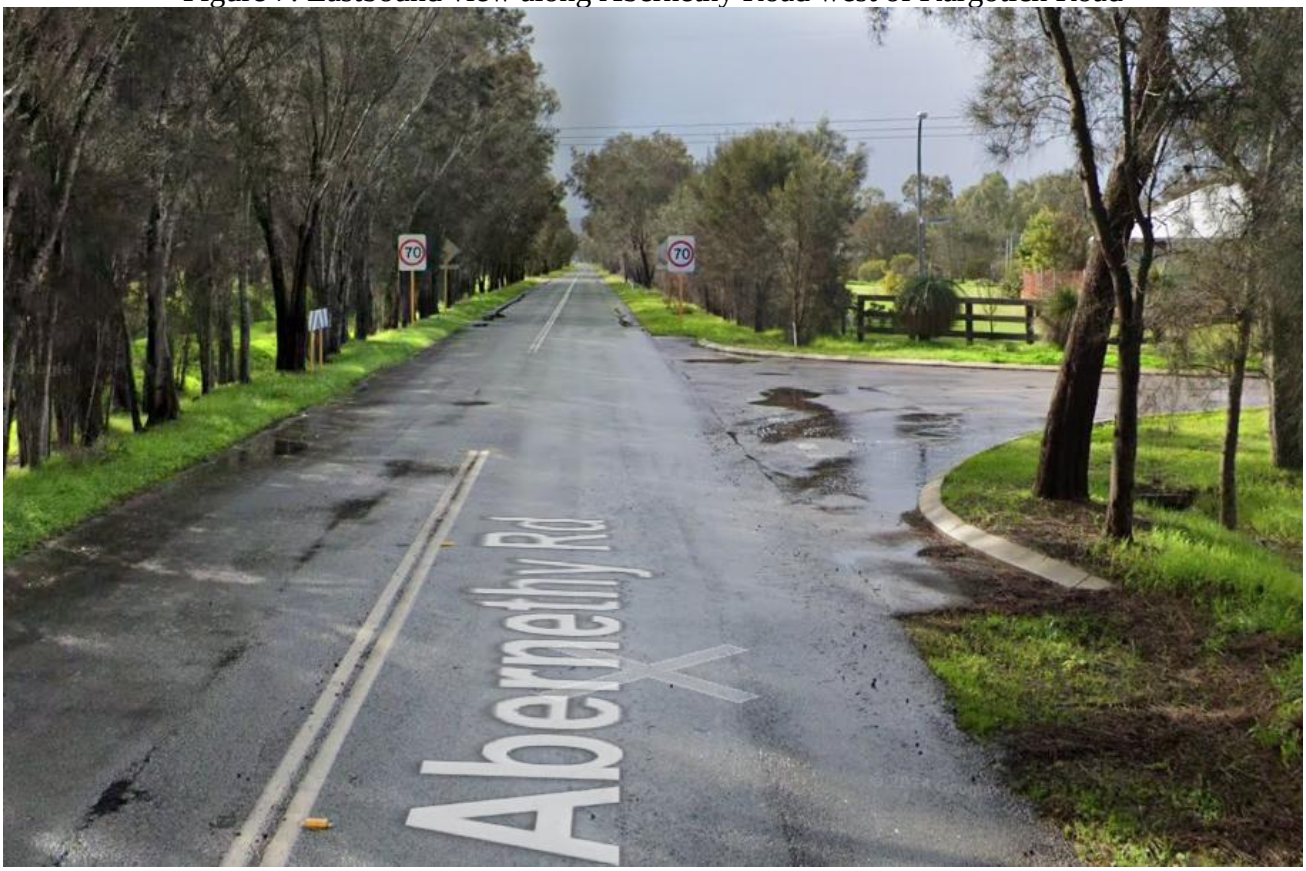


Figure 8: Eastbound view along Abernethy Road east of Kargotich Road

To the east of Kargotich Road, Abernethy Road has a weekday combined AM peak of 138v/h (48v/h EB and 90v/h WB) that occurs between 07:00 and 08:00. At this same location, the combined

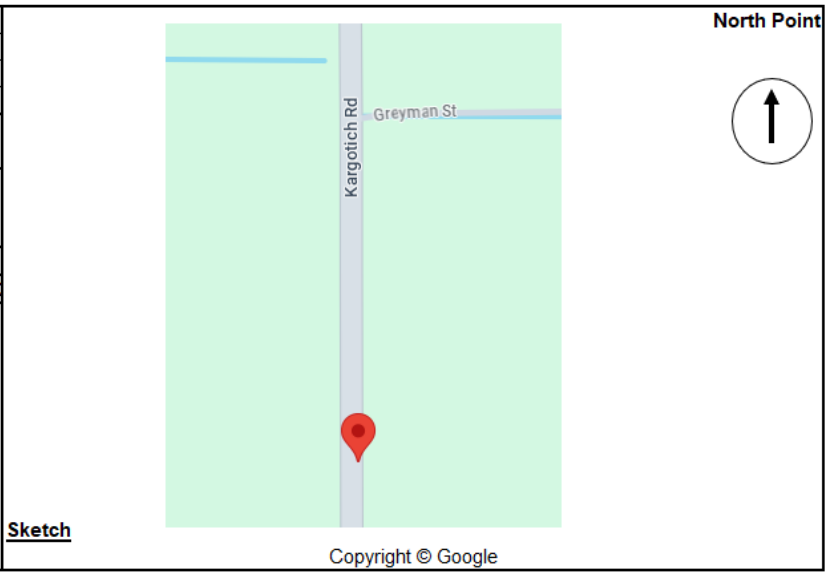
weekday PM peak is 130v/h (68v/h EB and 76v/h WB) that occurs between 16:00 and 17:00. To the west of Kargotich Road, Abernethy Road has a weekday combined AM peak of 184v/h (78v/h EB and 107v/h WB) that occurs between 08:00 and 09:00. At this same location, the combined weekday PM peak is 164v/h (71v/h EB and 96v/h WB) that occurs between 15:00 and 16:00.
Abernethy Road does not form part of the RAV or OSOM road networks. East of Kargotich Road, Abernethy Road has an average weekday heavy vehicle composition of 7.0% and to the west of Kargotich Road, an average weekday heavy vehicle composition of 11.7%.
The available speed compliance data does not reflect the new speed limits currently applied to Abernethy Road.

3.2 Existing Traffic Volumes.

With respect to the immediate location of the proposed development, the SSJ traffic count data provides the most accurate being collected some 500m south of Thomas Road.

Automatic Traffic Counts - Site Data

Site No:	Kargotich-02
Date:	Friday 02 Aug 2024
Start Time:	0:00
Officer:	ATS
Road:	Kargotich Road
Suburb:	Oakford
LOCATION: 500m S of Thomas Road	
Map/GPS Ref:	https://maps.google.com/?q=-3
Comments:	



STREET NAME :	Kargotich Road	LOCATION:	500m S of Thomas Road
SUBURB:	Oakford	START DATE :	Friday 02 Aug 2024
FILE NAME :	Kargotich-02NS0Individual434.t	FINISH DATE :	Friday 09 Aug 2024
SITE ID NUMBER :	Kargotich-02	SPEED ZONE :	90
PREPARED BY :	Austraffic	ROAD CLASSIFICATION:	Local

		DIRECTION OF TRAVEL		
		TWO-WAY	Northbound	Southbound
TRAFFIC VOLUME: [VEH/DAY]	Week Days Only Average	4,425	2,223	2,202
	Total Survey Average	4,143	2,064	2,079
WEEK DAY PEAK HOUR VOLUME: AM	7:00	438	337	120
PM	16:00	515	148	367
PEAK DAY		Tue 06 Aug 2024	Tue 06 Aug 2024	Tue 06 Aug 2024
PEAK DAY VOLUME		5424	2845	2579
WEEKDAY PACE	15Kph Pace Starts	78	78	78
	% Pace Volume	67%	68%	66%
TOTAL SPEEDS: Km/Hr	85th Percentile	93.4	93.2	93.7
	Average	85.3	85.2	85.3
95th Percentile	Friday 02/08/24	98.9	98.4	99.2
	Saturday 03/08/24	99.6	100.5	98.4
	Sunday 04/08/24	100.6	100.8	100.1
	Monday 05/08/24	98.8	98.2	99.4
	Tuesday 06/08/24	98.1	96.9	98.1
	Wednesday 07/08/24	97.8	96.1	98.9
	Thursday 08/08/24	98.2	98.0	98.3
CLASSIFICATION % *:	Week Days CLASS 1 %	81.2%	80.2%	82.2%
	Week Days Commercial	16.5%	17.7%	15.3%

NOTES : (OBSERVATIONS)

* CLASS 1 - Short Vehicles up to 5.5m
Commercial - Classes 3 to 12 inclusive

Figure 9: Kargotich Road Traffic Data (Source: SSJ Traffic Counts)

From a midblock perspective, the traffic data available from the MRWA traffic map, whist not as location accurate, will be used for the purposes of determining the Kargotich Road midblock data from a conservative approach as it is providing slightly higher demand. The difference in demand

may be attributed to the effect of traffic flow during the construction of the new Thomas Road and Kargotich Road roundabout controlled intersection.

mainroads WESTERN AUSTRALIA

SITE 51194

Hourly Volume

Kargotich Rd (1080009)

South of Orton Rd (SLK 7.30)

2023/24
Monday to Friday

	All Vehicles			Heavy Vehicles			
	NB	SB	Both	NB	SB	Both	%
00:00	3	6	9	0	1	1	11.1
01:00	3	2	5	0	0	0	0.0
02:00	6	1	7	2	0	2	28.6
03:00	10	7	17	4	4	8	47.1
04:00	45	18	63	12	6	18	28.6
05:00	208	75	283	67	18	85	30.0
06:00	392	151	543	104	36	140	25.8
07:00	377	168	545	87	43	130	23.9
08:00	223	141	364	57	37	94	25.8
09:00	116	111	227	39	33	72	31.7
10:00	105	98	203	33	35	68	33.5
11:00	101	110	211	36	39	75	35.5
12:00	92	114	206	36	43	79	38.3
13:00	111	141	252	40	47	87	34.5
14:00	142	221	363	37	61	98	27.0
15:00	168	366	534	49	94	143	26.8
16:00	193	457	650	52	107	159	24.5
17:00	175	395	570	36	75	111	19.5
18:00	96	147	243	19	32	51	21.0
19:00	51	55	106	12	12	24	22.6
20:00	39	50	89	11	9	20	22.5
21:00	26	30	56	5	4	9	16.1
22:00	15	18	33	2	4	6	18.2
23:00	18	11	29	2	1	3	10.3
TOTAL	2715	2893	5608	742	741	1483	26.4

Peak Statistics

AM	TIME	06:00	07:15	07:00	05:45	06:30	06:15
	VOL	392	173	545	110	44	148
PM	TIME	15:45	16:15	16:15	16:00	16:00	16:00
	VOL	200	471	665	52	107	159

Figure 10: Kargotich Road weekday hourly traffic demand (Source: MRWA Traffic Maps)

The Kargotich Road weekday AM peak traffic demand occurs between 07:00 and 08:00 with a combined peak demand of 545v/h (392v/h NB and 151v/h SB). The PM peak occurs between 16:00 and 17:00 with a combined peak demand of 650v/h (193v/h NB and 457v/h SB)
For the purposes of a broader impact consideration, the movement data is provided below for the Thomas Road and Kargotich Road roundabout. The data does represent the movements prior to the construction of the Thomas Road and Kargotich Road roundabout, however, still provide combined approach traffic demands that align with the current Thomas Road and Kargotich Road to some extent.

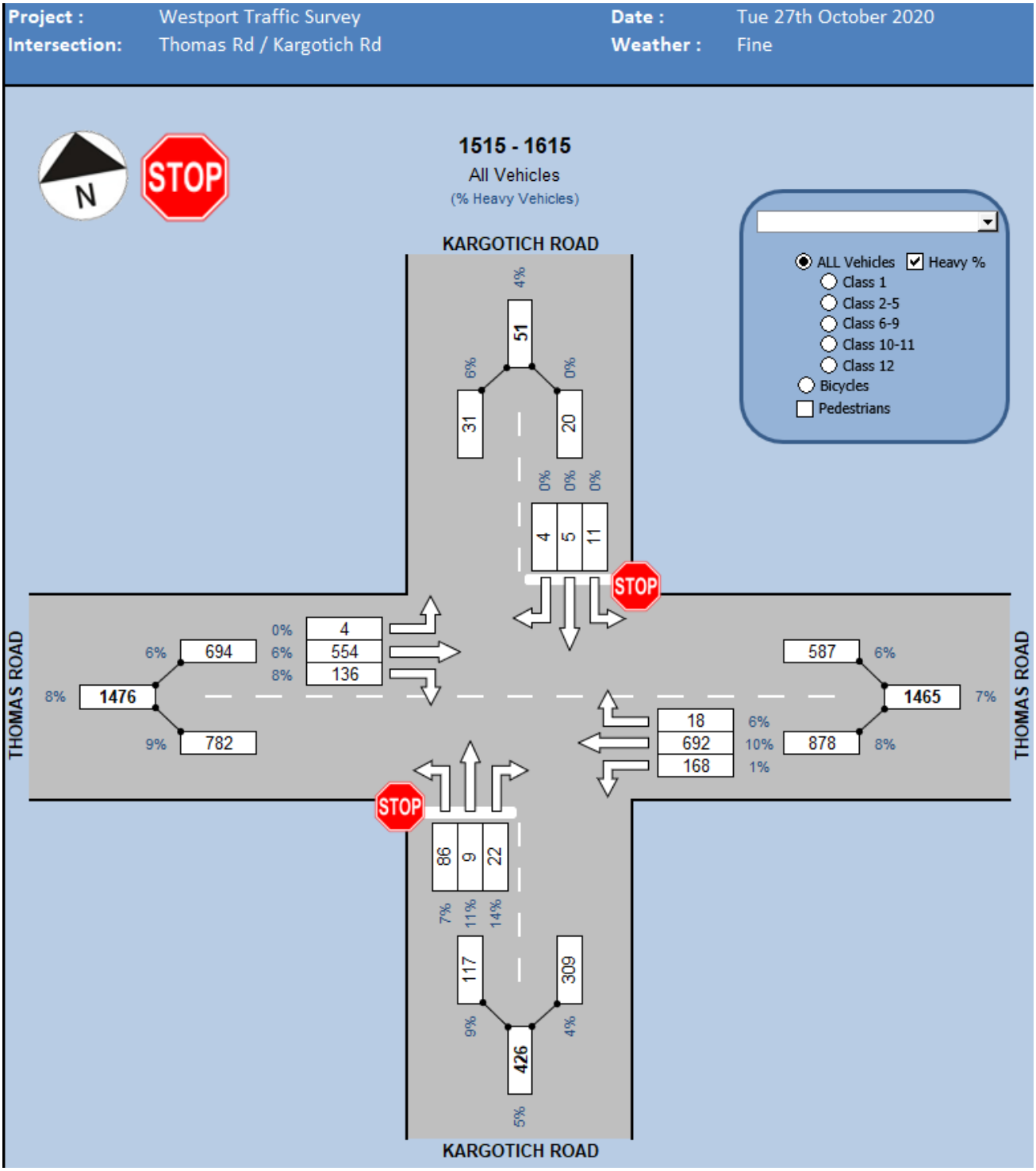


Figure 11: Thomas Road and Kargotich Road intersection weekday peak movement demands (Source: MRWA Traffic Maps)

3.3 Existing Traffic Volumes.

The MRWA Heavy Vehicle Services (HVS) RAV mapping tool shows that Kargotich Road forms part of the Tandem Drive Network 3 with conditions. The conditions are detailed below:

- All operators must carry written support from the road manager acknowledging the operator's use of the road.
- Maximum speed 90 km/h

- No Operation between the hours of sunset and sunrise
- Operation is not permitted while the school bus is operating on the road. Operators must contact the relevant schools and obtain school bus timetables; or where direct contact can be made with the school bus driver, operation is permitted once the school bus driver confirms all school drop-offs/pick-ups have been completed on the road.

The network conditions do not alter the proposed developments impact on the existing RAV network for Kargotich Road.

Time	Vehicle Classification														Speed	
Starting	1	2	3	4	5	6	7	8	9	10	11	12	13	Total	Ave.	85%ile
0:00	10.4	0.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	82.5	91.7
1:00	8.7	0.1	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	83.6	92.2
2:00	11.3	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	12.6	84.3	93.0
3:00	10.0	0.1	1.1	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	88.8	98.8
4:00	25.0	0.6	5.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.0	89.7	97.4
5:00	104.7	2.1	17.3	1.0	0.0	0.1	0.6	0.1	0.9	0.1	0.0	0.0	0.0	127.0	88.7	95.7
6:00	261.1	5.7	35.7	4.4	1.9	2.0	2.0	0.6	1.1	0.1	0.1	0.0	0.0	314.9	85.3	92.1
7:00	289.6	7.6	36.3	5.1	4.6	0.4	1.6	0.0	4.7	0.1	0.1	0.0	0.0	350.1	85.7	92.5
8:00	190.9	5.9	26.4	4.0	13.0	0.3	0.4	0.4	6.7	0.1	0.4	0.0	0.0	248.6	84.1	92.3
9:00	150.7	6.0	21.3	4.3	13.1	1.3	0.9	0.3	6.3	0.1	0.3	0.0	0.0	204.6	83.4	92.1
10:00	159.1	9.6	21.3	3.0	15.1	1.3	1.4	0.4	6.4	0.1	0.0	0.0	0.0	217.9	83.2	91.8
11:00	186.0	9.9	20.9	4.9	13.9	0.9	1.9	0.4	6.3	0.3	0.0	0.0	0.0	245.1	83.7	92.2
12:00	186.0	10.1	22.6	3.4	11.6	0.6	2.0	0.7	5.9	0.3	0.4	0.0	0.0	243.6	85.0	93.2
13:00	194.6	10.3	23.4	4.4	9.6	0.7	1.9	0.9	6.7	0.1	0.0	0.0	0.0	252.6	85.2	93.5
14:00	249.7	11.9	25.9	4.7	11.4	1.0	0.9	0.7	7.7	0.1	0.1	0.0	0.0	314.1	85.7	93.8
15:00	355.6	11.6	37.4	4.9	8.6	1.4	2.1	0.4	5.6	0.0	0.1	0.0	0.0	427.7	86.3	94.0
16:00	448.4	10.7	45.3	5.3	0.9	0.6	3.3	0.6	3.7	0.0	0.1	0.0	0.0	518.9	87.1	94.2
17:00	358.4	8.3	27.1	2.3	0.4	0.4	1.6	0.1	0.7	0.3	0.1	0.0	0.0	399.9	87.0	93.8
18:00	139.7	4.4	9.7	1.0	0.1	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.0	155.6	85.3	93.9
19:00	72.7	0.9	6.4	0.3	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	80.9	85.8	94.5
20:00	53.4	1.1	3.9	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	58.7	84.2	92.3
21:00	60.9	0.9	4.4	0.4	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	67.0	79.9	90.0
22:00	49.3	0.3	3.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	52.9	79.6	90.5
23:00	24.4	0.4	1.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.9	82.9	91.8
Total	3601	119	400	55	104	11	21	6	63	2	2	0	0	4384	85.4	93.5
	82.1%	2.7%	9.1%	1.2%	2.4%	0.3%	0.5%	0.1%	1.4%	0.0%	0.0%	0.0%	0.0%			

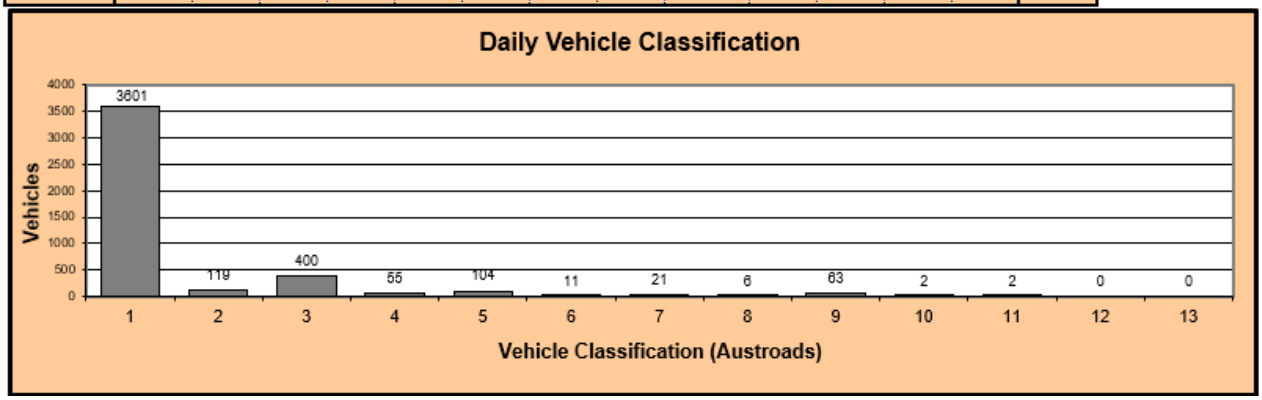


Figure 12: Kargotich Road vehicle classification (Source: SSJ traffic counts)

mainroads WESTERN AUSTRALIA

Hourly Vehicle Type Volumes

Kargotich Rd (1080009)

South of Orton Rd (SLK 7.30)

SITE 51194

2023/24

Monday to Friday

Northbound

Vehicle Type

	1	2	3	4	5	6	7	8	9	10	11	12	All
00:00	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	3	1	2	0	0	0	0	0	0	0	0	0	6
03:00	6	0	2	0	1	0	0	0	0	1	0	0	10
04:00	32	1	10	1	1	0	0	0	0	0	0	0	45
05:00	138	3	64	1	0	0	1	0	1	0	0	0	208
06:00	278	10	92	0	1	3	3	1	4	0	0	0	392
07:00	286	4	61	2	0	0	4	2	18	0	0	0	377
08:00	164	2	40	1	0	0	2	2	12	0	0	0	223
09:00	73	4	26	1	0	1	1	1	9	0	0	0	116
10:00	69	3	16	2	0	1	2	1	11	0	0	0	105
11:00	63	2	18	1	0	1	3	2	11	0	0	0	101
12:00	51	5	19	1	1	1	0	3	11	0	0	0	92
13:00	66	5	23	1	0	1	2	4	9	0	0	0	111
14:00	101	4	23	1	0	1	3	2	7	0	0	0	142
15:00	119	0	33	1	0	2	2	2	7	1	1	0	168
16:00	138	3	44	1	0	1	3	1	2	0	0	0	193
17:00	138	1	32	0	0	1	2	1	0	0	0	0	175
18:00	76	1	17	1	0	0	1	0	0	0	0	0	96
19:00	38	1	9	1	0	1	1	0	0	0	0	0	51
20:00	27	1	8	0	1	0	1	0	1	0	0	0	39
21:00	21	0	3	0	1	0	0	0	0	1	0	0	26
22:00	13	0	2	0	0	0	0	0	0	0	0	0	15
23:00	16	0	2	0	0	0	0	0	0	0	0	0	18
TOTAL	1922	51	546	16	6	14	31	22	103	3	1	0	2715

Peak Statistics

AM	TIME	06:45	06:00	05:45	07:00	03:15	06:00	06:15	10:30	07:00	03:00			06:00
	VOL	287	10	100	2	2	3	4	3	18	1			392
PM	TIME	16:30	13:45	16:15	15:45	20:45	16:30	16:45	13:30	12:15	21:15	15:15		15:45
	VOL	149	5	44	2	2	2	3	4	12	1	1		200

Figure 13: Kargotich Road northbound vehicle classification (Source: MRWA traffic maps)

mainroads WESTERN AUSTRALIA

Hourly Vehicle Type Volumes

Kargotich Rd (1080009)

South of Orton Rd (SLK 7.30)

SITE 51194

2023/24

Monday to Friday

Southbound

Vehicle Type

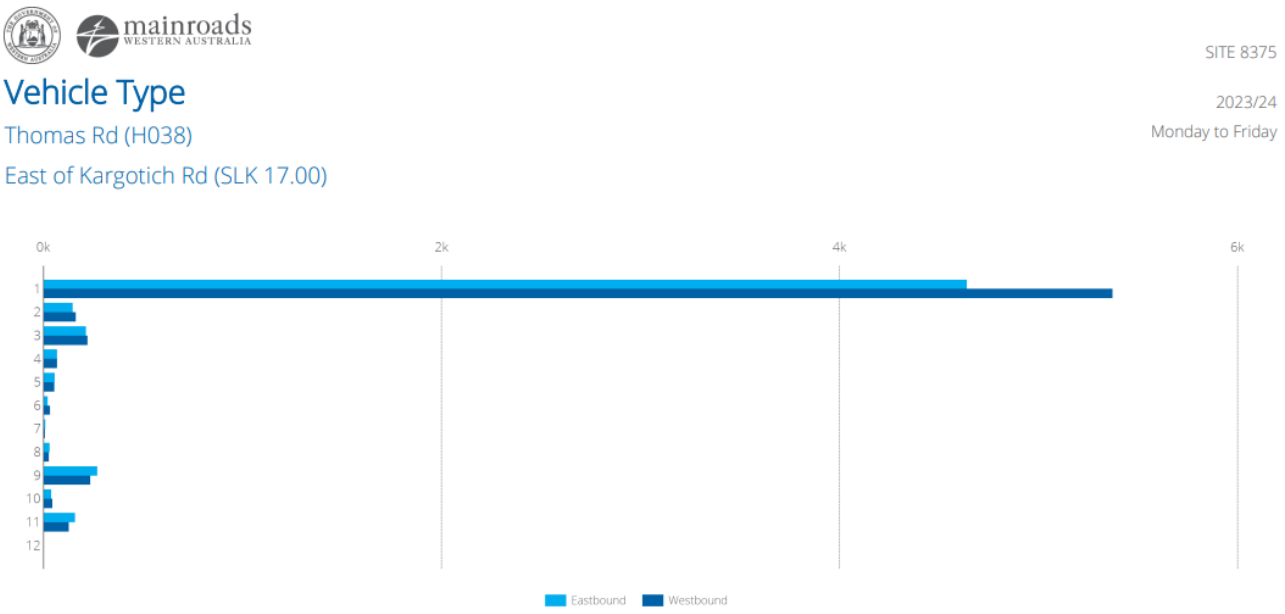
	1	2	3	4	5	6	7	8	9	10	11	12	All
00:00	5	0	1	0	0	0	0	0	0	0	0	0	6
01:00	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	3	0	1	1	1	0	0	0	0	1	0	0	7
04:00	12	0	4	1	0	0	0	0	1	0	0	0	18
05:00	54	3	15	1	0	0	1	0	1	0	0	0	75
06:00	113	2	30	1	0	1	1	1	2	0	0	0	151
07:00	122	3	24	3	0	0	1	1	14	0	0	0	168
08:00	102	2	20	1	0	1	1	1	13	0	0	0	141
09:00	72	6	18	1	0	0	2	1	11	0	0	0	111
10:00	60	3	15	2	0	1	2	2	13	0	0	0	98
11:00	67	4	20	1	1	1	2	1	13	0	0	0	110
12:00	68	3	24	1	0	0	0	3	15	0	0	0	114
13:00	91	3	26	0	2	2	1	3	13	0	0	0	141
14:00	156	4	43	2	1	1	2	1	11	0	0	0	221
15:00	266	6	74	2	1	4	2	1	10	0	0	0	366
16:00	343	7	99	1	0	0	2	0	5	0	0	0	457
17:00	313	7	69	1	0	2	1	1	1	0	0	0	395
18:00	113	2	30	0	0	0	1	0	1	0	0	0	147
19:00	42	1	10	0	0	0	1	0	1	0	0	0	55
20:00	41	0	8	0	1	0	0	0	0	0	0	0	50
21:00	25	1	3	0	0	0	0	0	0	1	0	0	30
22:00	14	0	3	0	0	1	0	0	0	0	0	0	18
23:00	10	0	1	0	0	0	0	0	0	0	0	0	11
TOTAL	2095	57	538	19	7	14	20	16	125	2	0	0	2893

Peak Statistics

AM	TIME	07:15	09:00	06:15	07:00	02:30	05:45	09:30	10:30	08:15	03:00			07:15
	VOL	134	6	33	3	1	1	4	3	16	1			173
PM	TIME	16:30	17:00	16:00	14:30	13:30	15:00	13:30	12:45	13:15	21:15			16:15
	VOL	368	7	99	3	3	4	3	4	15	1			471

Figure 14: Kargotich Road southbound vehicle classification (Source: MRWA traffic maps)

According to the MRWA HVS RAV mapping tool, Thomas Road forms part of the tandem drive Network 7. It also forms part of the RAV tri drive Network 4 as well as other RAV combination networks such as Accredited Mass Management Scheme (AMMS) and Perfomance Based Standard (PBS).



	Austroads Classification Scheme 1994													
	1	2	3	4	5	6	7	8	9	10	11	12	Heavy	Total
E	4641	147	213	68	56	22	9	32	270	40	159	1	870	5658
%	82.0	2.6	3.8	1.2	1.0	0.4	0.2	0.6	4.8	0.7	2.8	0.0	15.4	
W	5373	162	221	68	54	33	7	27	236	46	128	0	820	6355
%	84.5	2.5	3.5	1.1	0.8	0.5	0.1	0.4	3.7	0.7	2.0	0.0	12.9	
E+W	10014	309	434	136	110	55	16	59	506	86	287	1	1690	12013
%	83.4	2.6	3.6	1.1	0.9	0.5	0.1	0.5	4.2	0.7	2.4	0.0	14.1	

Figure 15: Thomas Road vehicle classification (Source: MRWA traffic maps)

3.4 Public Transport Access

There are no public transport services available in the subject locality at present. There are insignificant residential density and other land uses in this locality at present to generate the necessary demand for such services. The nearest Public Transport available is the bus service in the locality of Byford. The train line to Byford is also currently shut down due to major infrastructure developments.

3.5 Pedestrian and Cyclist Facilities

Kargotich Road in the location of the subject site for the Proposed development has no off road path facilities or no on road cycling facilities. Kargotich Road is not a road recommended for on road cycling by the Department of Transport or other cycling organisations such as Westcycle

Thomas Road either side of Kargotich Road has no off-road path facilities for pedestrians or cyclists. Kargotich Road has a 2m wide sealed verge in the east bound direction and a 1m wide sealed verge in the westbound direction. There is no provision for cyclists at the newly constructed Thomas Road and Kargotich Road roundabout controlled intersection.

3.6 Crash Data

The Thomas Road and Kargotich Road intersection has recently undertaken significant improvement and reconfiguration with respect to efficiency, intersection control and safety with the construction of a two lane approach roundabout for the Thomas Road and Kargotich Road south leg approaches. The north leg of Kargotich Road still has connectivity however has a single lane approach to the roundabout due to the significantly lower volumes.

Due to the recent improvement at this intersection, a reasonable crash history has not yet been established, however, with the intersection now having a roundabout control with horizontal geometry pre-deflection on approach, the risk of a high speed impact and overall severity of a collision is likely to be significantly reduced.

The most recent crash data is detailed in Appendix C of this report.

4 DEVELOPMENT PROPOSAL

4.1 Proposed Site Location

The subject site is located along Kargotich Road between Thomas Road and Greyman Street, more specifically Kargotich Road SLK3.45 – SLK3.55. The subject site is currently vacant land.

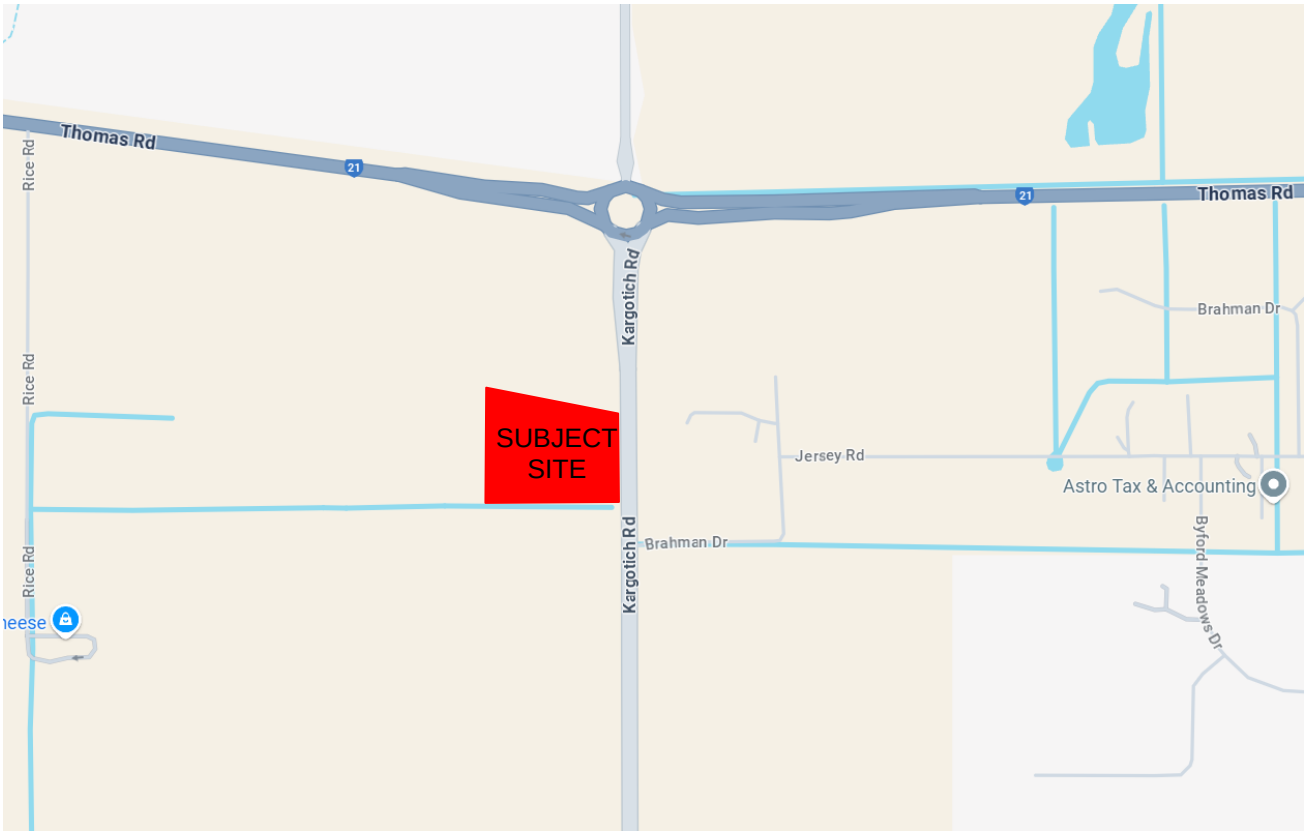


Figure 16: Subject Site location at Kargotich Road, Oakford

4.2 Proposed Site Use

According to the proposed developments plan in Appendix A of this report, the proposal includes:

- The Tonkin Extension Alliance's Project site office
- Service / Maintenance Facility
- A total of 205 carpark bays
- 3 ACROD Bays

Strada Consultants is of the understanding that sufficient parking facilities have been made available to accommodate the vehicle parking demand from the Tonkin Extension Alliance employees and visitors.

The layout of the proposed development is shown in the site plan in Appendix A.

4.3 Proposed Access

Access to the subject site is proposed to be via three crossover locations:

- Crossover 1 – The Project office car park entry (southernmost cross over)
- Crossover 2 – The Project office car park exit
- Crossover 3 – The Project office service facility / delivery & maintenance access (northern most cross over).

The access proposed has been developed with liaison with The Tonkin Extension Alliance. The access shown in Figure

The Project office car park -
The Project office car park is suitably designed to accommodate a 12m service vehicle. The entry crossover will provide for both left and right turn movements in to the carpark from Kargotich Road. Noting the low-speed approach to the subject site from the southbound direction of Kargotich Road, the right turn movement from the Kargotich Road southbound has been afforded a 60m turning lane for vehicles waiting to turn to use to reduce the risk of a rear end collisions.

The car park itself will generally accommodate a one-way movement arrangement to optimise parking bays and reduce the likelihood of a low speed accident occurring in the carpark, for both drivers and pedestrians.

The carpark exit will provide for a left only movement to Kargotich Road. Vehicles requiring to travel south bound on Kargotich Road leaving the proposed development are required to travel to the Thomas Road roundabout and use the third exit before travelling southbound on Kargotich Road. It is anticipated a low demand for Kargotich Road south bound users compared to the carpark users that will likely travel north to access Thomas Road to the wither Nicholson Road or the Kwinana Freeway or use Thomas Road to access Tonkin Highway or the South Western Highway. The right turn movement is proposed to be eliminated to reduce the risk, where possible, of uncontrolled right turn movements being involved in a T-collision.

The Project office service facility -
The third crossover is the northern most and will be used for the service driveway to accommodate movements up to 19m in length such as a prime mover and semi-trailer. This crossover has been designed to accommodate both left and right entry movements and left only exit movements. Whilst Kargotich Road is restricted access vehicle (RAV) route up to network 3 (with conditions) up to 27m in length. The proposed development has been designed to accommodate vehicles only up to a 19m in length for the Service crossover due to the limited area for a vehicle longer than 19m to be able to manoeuvre within the development lot.

Both the proposed development road and carpark layout and the swept paths have been prepared for the design vehicles for all three crossover movements as detailed in Appendix B

5 COMMITTED DEVELOPMENTS AND OTHE TRANSPORT PROPOSALS

Currently there are a number of developments underway at the writing of this report that the proposed development may have an impact upon. The known committed developments that will also generate additional traffic demand on Kargotich Road include:

- The Service Station / veterinary clinic adjacent to the Tonkin Extension Alliance proposed development.
- The Tonkin Highway Extension Project and Thomas Road Upgrade Project construction works.
- The industrial development in the vicinity of Leipold Road and Scott Road.

6 CHANGES TO SURROUNDING TRANSPORT NETWORK

The development proposes to relocate the existing 70km/h and 90 km/h speed zone signage north of Greyman Street to south of Greyman Street. The recently constructed turn lanes and road widening on Kargotich Road at Greyman Street will be maintained. There are no further changes to the surrounding transport network as a result of the proposed development.

7 ASSESSMENT YEARS AND TIME PERIODS

The proposed development has been reviewed and assessed based on the anticipated service life of not more than four years to align with the completion of the Tonkin Highway Extension Project and the concurrent Thomas Road Upgrade Project which is expected to be completed late 2028.

8 DEVELOPMENT GENERATION AND DISTRIBUTION

The proposed development makes provision of 205 vehicle bays for the Project site office carpark. Typical Project site office behaviour for such major infrastructure project office, is that the majority of the staff arrive between the hours of 06:30 and 09:00 on weekdays. The arrival period is typically spread over a larger window of arrival depending on the individual office users' position within the project and hours of work. Employees in the managerial positions typically work hours 06:30 / 07:00 to 17:00 / 17:30, whereas administrative employees of similar offices typically work 8:30 / 09:00 to 17:00 / 17:30.

For the departure of the car park, typically most employees leave between 17:00 and 18:00.

For the purposes of design traffic flows, the arrival demand during the peak period of flow for Kargotich Road has been estimated for 75% of the carpark capacity to arrive during the Kargotich Road peak hour. This equates to approximately 158 vehicles arriving.

Similarly, for the PM peak demand departing the carpark, this has been modelled to show close to 100% of the movements occurring during the PM peak. This equates to 200v/h departing the car park.

It is anticipated that due to the surrounding network connectivity, that the significant majority of car park users will likely be arriving to the proposed development via Thomas Road and departing to Thomas Road. This has been estimated to be approximately 80% of all movements.

9 IMPACT ON SURROUNDING ROADS

The impact on Kargotich Road has been demonstrated using SIDRA Modelling. The modelling of the proposed development's impact on the surrounding roads has been reviewed primarily with the development's driveway configuration on Kargotich Road. The impact on Kargotich Road has been demonstrated using SIDRA Modelling. The modelling has been undertaken showing the impact during both AM and PM peak periods.

The modelling outputs have determined that the proposed development will have a low impact on the performance of Kargotich Road locally at the Project Office carpark resulting in a Level of Service A across all movement flows for both the AM and PM peak periods.

MOVEMENT SUMMARY

Site: N/Av [Tonkin Hwy Extension Project Office AM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kargotich Rd															
1	L2	All MCs	53	7.4	53	7.4	0.313	5.8	LOS A	0.0	0.0	0.00	0.24	0.00	43.6
2	T1	All MCs	413	29.0	413	29.0	0.313	2.4	LOS A	0.0	0.0	0.00	0.24	0.00	53.1
Approach			465	26.6	465	26.6	0.313	2.8	NA	0.0	0.0	0.00	0.24	0.00	51.9
North: Kargotich Rd															
8	T1	All MCs	177	27.6	177	27.6	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	All MCs	147	7.4	147	7.4	0.152	4.7	LOS A	0.6	5.1	0.55	0.51	0.55	42.5
Approach			324	18.4	324	18.4	0.152	2.1	NA	0.6	5.1	0.25	0.23	0.25	47.5
West: Project Office Carpark															
10	L2	All MCs	158	7.4	158	7.4	0.164	7.8	LOS A	0.6	5.1	0.50	0.71	0.50	35.3
Approach			158	7.4	158	7.4	0.164	7.8	LOS A	0.6	5.1	0.50	0.71	0.50	35.3
All Vehicles			947	20.6	947	20.6	0.313	3.4	NA	0.6	5.1	0.17	0.32	0.17	48.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Figure 17: Proposed development AM peak period movement summary

LANE LEVEL OF SERVICE

Lane Level of Service

Site: N/Av [Tonkin Hwy Extension Project Office AM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Existing Design
Give-Way (Two-Way)

	Approaches			Intersection
	South	North	West	
LOS	NA (TWSC)	NA (TWSC)	A	NA (TWSC)

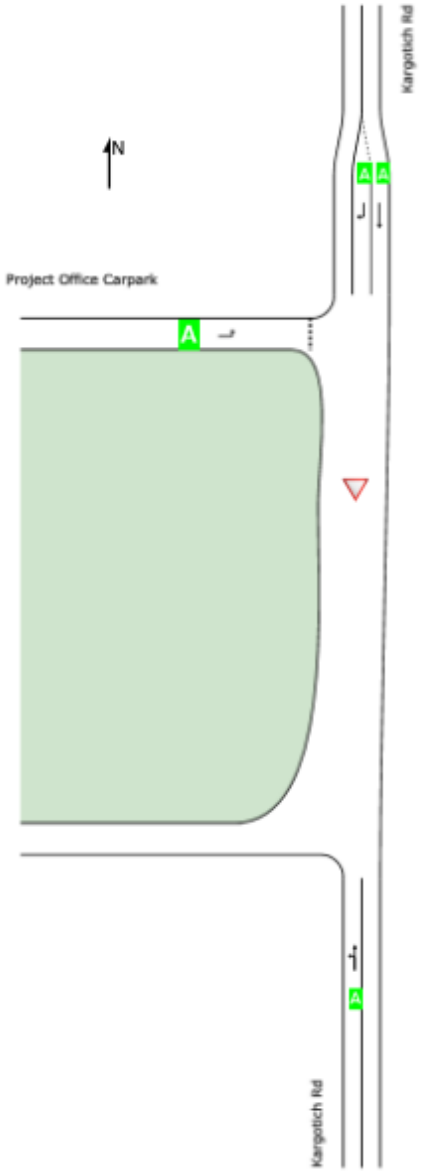


Figure 18: Proposed development AM peak period level of service summary

DEGREE OF SATURATION

Ratio of Arrival Flow to Capacity, v/c ratio per lane

Site: N/Av [Tonkin Hwy Extension Project Office AM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Existing Design
Give-Way (Two-Way)

	Approaches			Intersection
	South	North	West	
Degree of Saturation	0.31	0.15	0.16	0.31

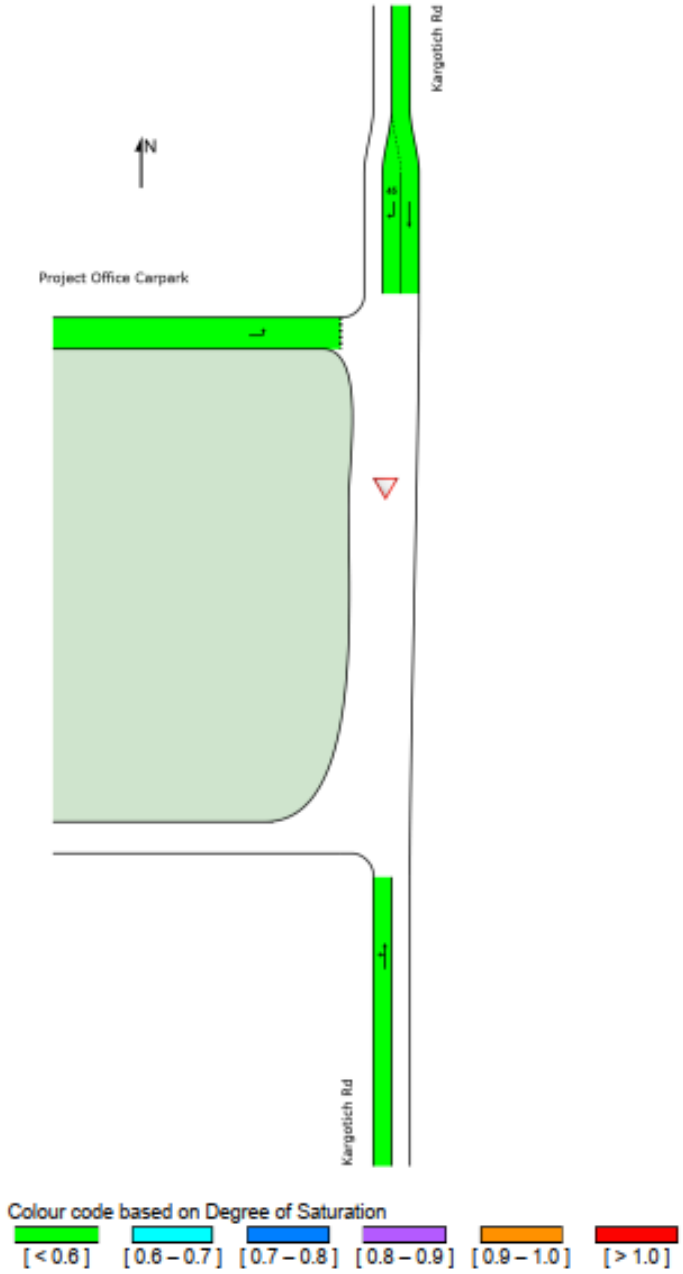


Figure 19: Proposed development AM peak period degree of saturation summary

MOVEMENT SUMMARY

Site: N/Av [Tonkin Hwy Extension Project Office PM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Kargotich Rd															
1	L2	All MCs	53	7.4	53	7.4	0.157	5.7	LOS A	0.0	0.0	0.00	0.28	0.00	43.2
2	T1	All MCs	185	29.0	185	29.0	0.157	2.4	LOS A	0.0	0.0	0.00	0.28	0.00	52.6
Approach			238	24.2	238	24.2	0.157	3.1	NA	0.0	0.0	0.00	0.28	0.00	50.4
North: Kargotich Rd															
8	T1	All MCs	440	27.6	440	27.6	0.299	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
9	R2	All MCs	147	7.4	147	7.4	0.110	3.1	LOS A	0.5	4.0	0.38	0.34	0.38	44.0
Approach			587	22.5	587	22.5	0.299	0.8	NA	0.5	4.0	0.10	0.08	0.10	48.9
West: Project Office Carpark															
10	L2	All MCs	200	7.4	200	7.4	0.154	6.4	LOS A	0.7	5.2	0.33	0.59	0.33	36.3
Approach			200	7.4	200	7.4	0.154	6.4	LOS A	0.7	5.2	0.33	0.59	0.33	36.3
All Vehicles			1025	20.0	1025	20.0	0.299	2.5	NA	0.7	5.2	0.12	0.23	0.12	47.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Figure 20: Proposed development PM peak period movement summary

LANE LEVEL OF SERVICE

Lane Level of Service

Site: N/Av [Tonkin Hwy Extension Project Office PM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Existing Design
Give-Way (Two-Way)

	Approaches			Intersection
	South	North	West	
LOS	NA (TWSC)	NA (TWSC)	A	NA (TWSC)

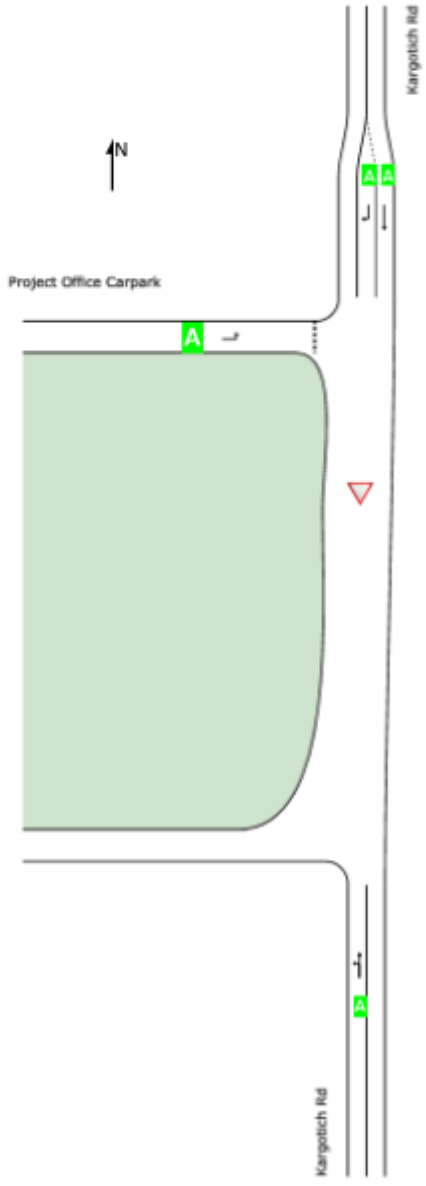


Figure 21: Proposed development PM peak period level of service summary

DEGREE OF SATURATION

Ratio of Arrival Flow to Capacity, v/c ratio per lane

Site: N/Av [Tonkin Hwy Extension Project Office PM Peak (Site Folder: AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

New Site
Site Category: Existing Design
Give-Way (Two-Way)

	Approaches			Intersection
	South	North	West	
Degree of Saturation	0.16	0.30	0.15	0.30

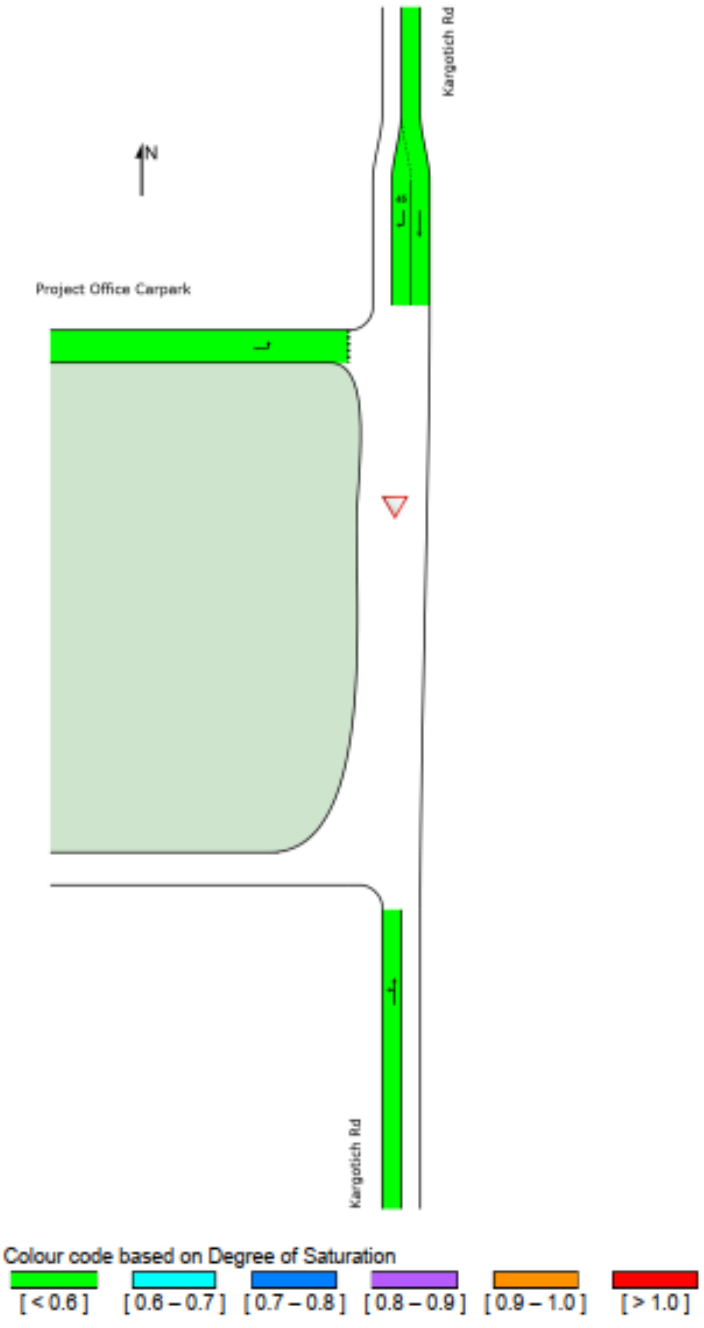


Figure 22: Proposed development AM peak period degree of saturation summary

The performance of the proposed developments impact on Kargotich Road can be attributed to:

- Low – moderate traffic demand on Kargotich Road
- Low – moderate traffic demand generated by the proposed development
- Dedicated turning lanes provided for right turn movements
- Left only movements when exiting the proposed development.

10 IMPACT ON SURROUNDING INTERSECTIONS

The intersections surrounding the proposed development include:

- Thomas Road and Kargotich Road.
- Kargotich Road and Greyman Street.
- Kargotich Road and Abernethy Road.
- Thomas Road and Tonkin Highway.
- Thomas Road and Nicholson Road.

The impact of the proposed development over the planned four-year service life on the surrounding network has been based on first principle of intersection demand due to the low volume the proposed development generates when dispersed network wide.

Beyond the proposed developments immediate crossover connections with Kargotich Road, almost all traffic generated will be required to traffic through the Thomas Road and Kargotich Road recently constructed roundabout controlled intersection – with the exception of the Kargotich Road north bound approach to the development. For the AM peak period, assuming 20% of vehicles are approaching the development from Kargotich Road north bound, this equates to approximately 125 vehicles are arriving from the Thomas Road and Kargotich road roundabout. Assuming that 50% of vehicles are then approaching from both east and west of the roundabout on Thomas Road, this reduces the additional traffic demand on each approach to an increase in of approximately 65 v/h on each approach.

Similar applies to the PM peak. With an estimated peak demand of 200v/h approaching the Thomas Road and Kargotich Road roundabout. With the roundabout having two lanes on the north bound approach and assuming a 50% left turn demand and 50% right turn demand, the movement demand per lane increases by 100v/h.

Despite the additional traffic demand generated to the Thomas Road and Kargotich Road roundabout controlled intersection, the intersection is significantly operating well under capacity.

For both the intersections of Greyman Street and Abernethy Road, with Kargotich Road, it is anticipated that the peak traffic demand generated by the proposed development along Kargotich Road south of the Subject Site is less than 20% of the total demand. The peak hourly demand along Kargotich Road in either the north or south bound is anticipated to increase by not more than 40v/h in either direction as a result of the proposed development.

For the Tonkin Highway and Nicholson Road intersections along Thomas Road, beyond the Kargotich Road roundabout, the impact on both these intersections has diminishing returns. The multi lane and multiple approaches at both these intersections has a very low impact to the level of service at these locations. (noting the recent upgrade of the Thomas Road and Nicholson Road intersection and the signalised intersection of Thomas Road and Tonkin Highway). It is also noted that throughout the course of the Project delivery, it is inevitable that the Tonkin Highway and Thomas Road intersection will need to be relocated and the interim intersection account for the relevant current demands at this intersection.

11 ROAD SAFETY

The crossover controls for the proposed development appear to implement measure to reduce the likelihood of accidents by maintaining or implementing:

- A good line of sight through the crossover intersections with Kargotich Road.
- Eliminating right turn movements where practicable.
- Providing vehicle storage in dedicated turning lanes where right turns can't practicably be eliminated.
- Providing a low-speed approach on Kargotich Road, particularly from the northbound by relocating the existing speed signs south of Greyman Street.

12 PUBLIC TRANSPORT ACCESS

The existing public transport services in the area are described in Section 3.4 of this report.

13 PEDESTRIAN ACCESS AND AMENITY

Pedestrian facilities are described in Section 3.5 of this report. No additional provision has been made for pedestrian access as there is no connecting network to the proposed development.

14 CYCLIST ACCESS AND AMENITY

Cycling facilities are described in Section 3.5 of this report. No additional provision has been made for cyclist access as there is no suitable connecting network to the proposed development.

15 PARKING AND PARKING MANAGEMENT

The Project office carpark strategy is described in Section 4.3 of this report. The principles of the proposed development with respect to the car park access and car park operation are listed below:

- Low speed approach to the Project site office carpark (relocate 70km/h zone).
- Elimination of uncontrolled right turn movements where possible to access the proposed development.
- Where a right turn cannot be suitably removed, provision for right turn lane to reduce the likelihood of rear end collisions.
- Separation of the entry crossover and exit crossover to the Project office carpark.
- Single lane with one way movement through the carpark.
- Maximum size vehicle limited to 12m service vehicle.
- Reverse parking only.
- Stop signs at exit with left turn only exit movement.

According to the development plan provided in Appendix A, the proposed development provides 205 parking bays including three ACROD bays.

It is Strada Consultants understanding that sufficient parking is provided to address the parking demand of the proposed development.

16 TRAFFIC MANAGEMENT PLAN

The Tonkin Highway Extension Alliance has developed a traffic management plan for the proposed development developed by Strada Consultants Pty Ltd.

17 CONCLUSION

This Traffic Impact Assessment has been prepared by Strada Consultants Pty Ltd for The Tonkin Extension Alliance. The subject of this report is the proposed development of The Alliances Project Site Office located at 1780 Thomas Road, Oakford in the Shire of Serpentine-Jarrahdale. The proposed development serves as the Project site office for both the MRWA deliverable Tonkin Highway Extension Project and the Thomas Road Upgrade Project.

The subject site is currently a vacant land and the accesses to the proposed development will be provided by three crossovers on Kargotich Road located between SLK3.45 – SLK3.55. The movement functions of the three crossovers are:

- Crossover 1 – Project site Crossover 1 – The Project office car park entry (southernmost cross over)
- Crossover 2 – The Project office car park exit
- Crossover 3 – The Project office service facility / delivery & maintenance access (northern most cross over).

Turning lanes are proposed to be provided for the right turn movements from Kargotich Road south bound into crossovers 1 and 3. The exit movements for crossovers 2 and 3 are proposed to be left turn only.

It is Strada Consultant's understanding that sufficient parking is provided to address the parking demands for the proposed development.

The swept path assessment confirms sufficient provision has been made for the maximum design vehicle of a 12m long service vehicle for the proposed project office carpark (cross over 1 add 2) and a maximum design vehicle of 19m prime mover and semi-trailer for the service / maintenance crossover (crossover 3).

The traffic modelling undertaken for the Kargotich Road and the project office carpark indicates that the proposed arrangement will operate satisfactorily with negligible queues and delays on Kargotich Road. A first principle review of intersection capacity, indicates a satisfactory impact to the level of service on the surrounding roads and intersections as a result of the traffic generated by the proposed development.

In conclusion, the findings of this Traffic Impact Assessment are supportive of the proposed development.

Prepared:

David Taylor
Strada Consultants Pty Ltd

Reviewed and Endorsed:

Travis Green
Strada Consultants Pty Ltd

APPENDIX A – PROPOSED DEVELOPMENT PLAN

Rev.	DATE	DESCRIPTION	APPROVED
0	12.05.25	ISSUED FOR STAKEHOLDER REVIEW	TG

METADATA

GROUND SURVEY STANDARD:

DATE OF CAPTURE:

MAPPING SURVEY STANDARD:

DATE OF CAPTURE:

MAIN ROADS PROJECT ZONE:

HEIGHT DATUM:

Tonkin Extension Alliance

strada road project consultants

DESIGNED	D.TAYLOR STAP-AWTM-23-11544-06	12.05.25	
DRAWN	D. TAYLOR STAP-AWTM-23-11544-06	12.05.25	
REVISED			
REVIEWED &ENDORSED	T.GREEN RTM037	12.05.25	

DRAWING TITLE

TONKIN EXTENSION ALLIANCE
SITE OFFICE COMPOUND LAYOUT
LONG-TERM AFTERCARE ARRANGMENT
TRAFFIC MANAGEMENT LAYOUT

SHEET: A1

SHEET No.: SHEET 1 OF 2

LOCAL AUTHORITY: SHIRE OF SERPENTINE/JARRAHDALE

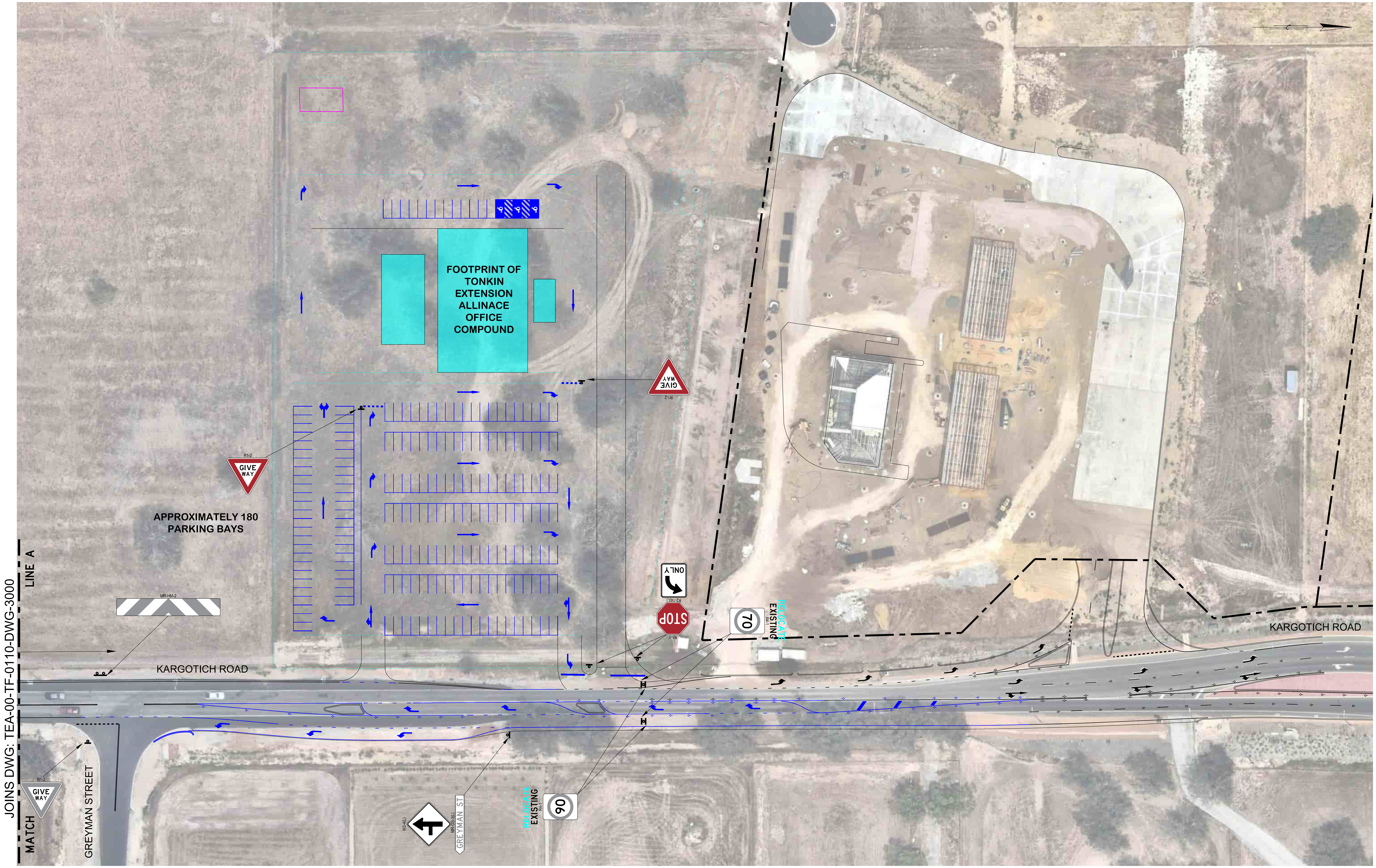
MAIN ROADS RESPONSIBILITY AREA: -

DRAWING STATUS: -

DRAWING NUMBER: TEA-00-TF-0110-DWG-3000

REV: 0

SCALE: 1:500@A1



1:500@A1

SCALE

Rev.	DATE	DESCRIPTION	APPROVED
1	12.05.25	REVISED ALIGNMENT FOR GREYMAN STREET INTERSECTION AND INTERIM SERVICE STATION CROSSOVER	TG
0	04.04.25	ISSUED FOR STAKEHOLDER REVIEW	TG

METADATA

GROUND SURVEY STANDARD:

DATE OF CAPTURE:

MAPPING SURVEY STANDARD:

DATE OF CAPTURE:

MAIN ROADS PROJECT ZONE:

HEIGHT DATUM:

Tonkin Extension Alliance

strada road project consultants

DESIGNED	D.TAYLOR STAP-AWTM-23-11544-06	04.04.25	
DRAWN	D. TAYLOR STAP-AWTM-23-11544-06	04.04.25	
REVISED	D.TAYLOR STAP-AWTM-23-11544-06	12.05.25	
REVIEWED & ENDORSED	T.GREEN RTM037	12.05.25	

DRAWING TITLE
TONKIN EXTENSION ALLIANCE
SITE OFFICE COMPOUND LAYOUT
LONG-TERM AFTERCARE ARRANGMENT
TRAFFIC MANAGEMENT LAYOUT

SHEET A1

SHEET No. SHEET 2 OF 2

LOCAL AUTHORITY SHIRE OF SERPENTINE/JARRAHDALE

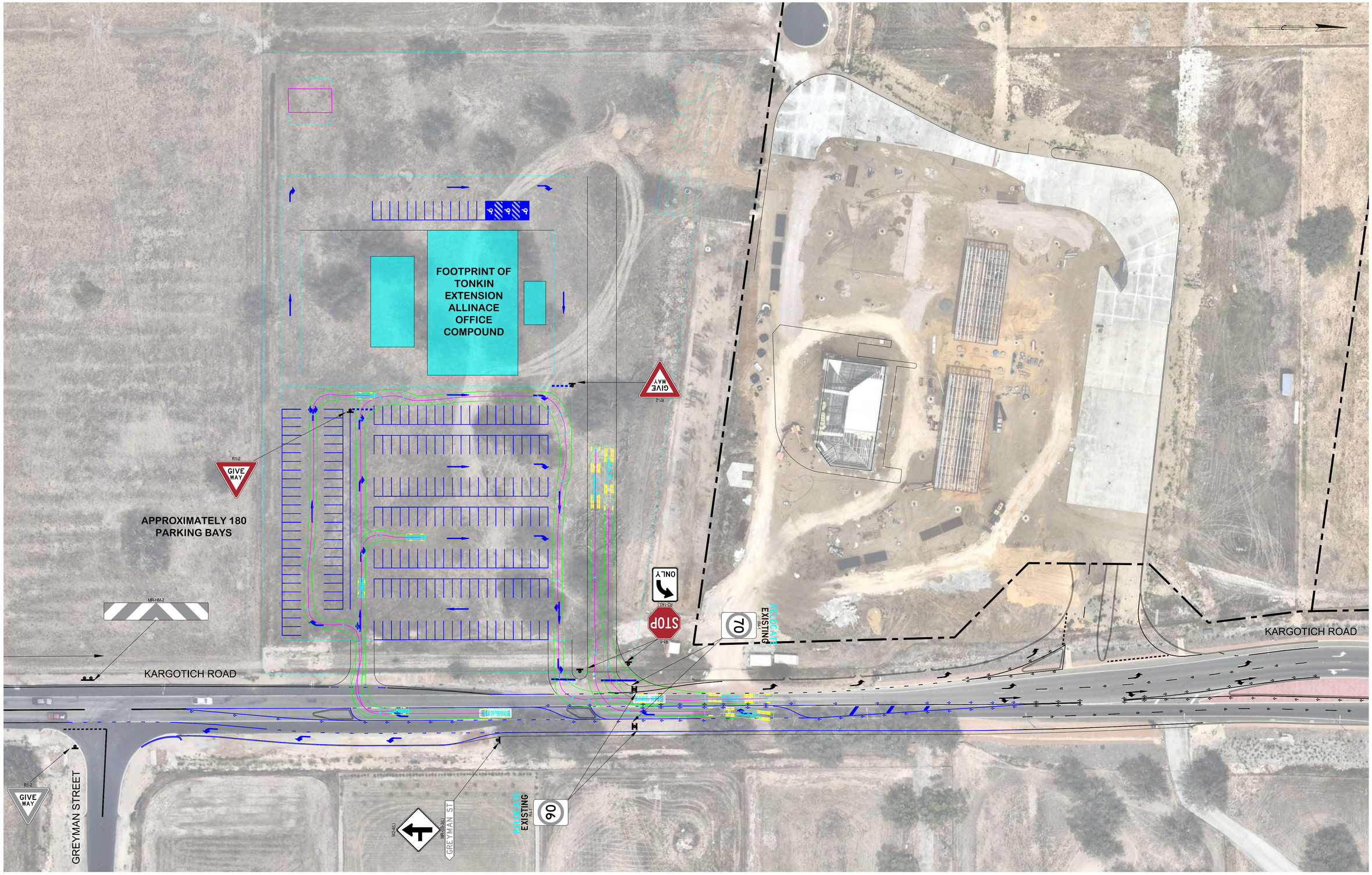
MAIN ROADS RESPONSIBILITY AREA -

DRAWING STATUS -

DRAWING NUMBER TEA-00-TF-0110-DWG-3001

REV 1

APPENDIX B – SWEPT PATH ANALYSIS



Rev.	DATE	DESCRIPTION	APPROVED
1	12.05.25	REVISED ALIGNMENT FOR GREYMAN STREET INTERSECTION AND INTERIM SERVICE STATION CROSSOVER	TG
0	04.04.25	ISSUED FOR STAKEHOLDER REVIEW	TG

METADATA

GROUND SURVEY STANDARD:

DATE OF CAPTURE:

MAPPING SURVEY STANDARD:

DATE OF CAPTURE:

MAIN ROADS PROJECT ZONE:

HEIGHT DATUM:

Tonkin Extension Alliance

strada road project consultants

DESIGNED	D. TAYLOR STAP-AWTM-23-11544-06	04.04.25	
DRAWN	D. TAYLOR STAP-AWTM-23-11544-06	04.04.25	
REVISED	D. TAYLOR STAP-AWTM-23-11544-06	12.05.25	
REVIEWED &ENDORSED	T.GREEN RTM037	12.05.25	

DRAWING TITLE

TONKIN EXTENSION ALLIANCE
SITE OFFICE COMPOUND LAYOUT
LONG-TERM AFTERCARE ARRANGMENT
SWEPT PATH DETAIL

SHEET A1

SHEET No. SHEET 1 OF 1

LOCAL AUTHORITY: SHIRE OF SERPENTINE/JARRAHDALE

MAIN ROADS RESPONSIBILITY AREA

DRAWING STATUS

DRAWING NUMBER: TEA-00-TF-0110-DWG-3002

REV: 1

SCALE: 1:500@A1

APPENDIX C – CRASH DATA

Detailed Crash History

Report Criteria

Parameter	Value	Description
Intersection	054070	KARGOTICH RD & THOMAS RD
From Date	01/01/2020	
To Date	31/12/2024	
Crash Type	All	
Severity	All	
Include Descriptions?	No	

Road	Road Name	SLK	CWY	True Dist	Intersection	Date	Day	Time	Severity	Crash No.	Type	Light Cond	Road Cond	Speed Limit	Traffic Control	Road Feature	Road Alignment	Speed Factor	MR Nature	Location	RUM	Unit	Unit Type	From Dir	To Dir	Veh/Ped Move	First Object Hit	Second Object Hit	Third Object Hit	Target Impact Point
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	22/02/2020	Saturday	1445	Medical	20206 42700	Intersection	Daylight	Dry	80	Stop Sign	4-way Intx	Straight		Non Collision	On Cway	75:Off Path On Straight: Lost Control On Cway	Colliding	Motor Cycle	E - THOMAS RD	W - THOMAS RD	Swerving: To Avoid Veh				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	31/10/2020	Saturday	1605	Medical	20208 82306	Intersection	Daylight	Dry	70	No Sign Or Control	4-way Intx	Straight		Rear End	On Cway	32:Same Dirn: Same Lane Left Rear	Colliding	Car	W - THOMAS RD	E - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	31/10/2020	Saturday	1605	Medical	20208 82306	Intersection	Daylight	Dry	70	No Sign Or Control	4-way Intx	Straight		Rear End	On Cway	32:Same Dirn: Same Lane Left Rear	Target	Car	W - THOMAS RD	N - KARGOTICH RD	Straight Ahead: Not Out Of Control				Rear
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	17/01/2021	Sunday	1430	Medical	20210 55703	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Colliding	Car	W - THOMAS RD	E - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	17/01/2021	Sunday	1430	Medical	20210 55703	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Target	Car	S - KARGOTICH RD	N - KARGOTICH RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	28/06/2021	Monday	0645	PDO Major	20212 85760	Intersection	Dawn Or Dusk	Wet	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	14:Intx: Thru - Right	Colliding		S - KARGOTICH RD	E - THOMAS RD	Turning: To Make Right Turn				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	28/06/2021	Monday	0645	PDO Major	20212 85760	Intersection	Dawn Or Dusk	Wet	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	14:Intx: Thru - Right	Target	Car	E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	09/09/2021	Thursday	0755	PDO Major	20214 09450	Intersection	Daylight	Wet	70	Stop Sign	4-way Intx	Curve		Right Angle	On Cway	12:Intx: Right - Thru	Colliding	Utility	W - THOMAS RD	E - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	09/09/2021	Thursday	0755	PDO Major	20214 09450	Intersection	Daylight	Wet	70	Stop Sign	4-way Intx	Curve		Right Angle	On Cway	12:Intx: Right - Thru	Target	Utility	S - KARGOTICH RD	E - THOMAS RD	Turning: To Make Right Turn				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	26/01/2022	Wednesday	1820	Medical	20220 83052	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Colliding	Utility	S - KARGOTICH RD	N - KARGOTICH RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	26/01/2022	Wednesday	1820	Medical	20220 83052	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Target		E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	14/04/2022	Thursday	1025	Hospital	20221 98552	Intersection	Daylight	Dry	70	No Sign Or Control	4-way Intx	Straight		Right Angle	On Cway	14:Intx: Thru - Right	Colliding	Car	E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	14/04/2022	Thursday	1025	Hospital	20221 98552	Intersection	Daylight	Dry	70	No Sign Or Control	4-way Intx	Straight		Right Angle	On Cway	14:Intx: Thru - Right	Target	Car	S - KARGOTICH RD	E - THOMAS RD	Turning: To Make Right Turn				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	19/04/2022	Tuesday	1730	PDO Major	20222 05471	Intersection			70	No Sign Or Control	4-way Intx			Right Angle	On Cway	11:Intx: Thru - Thru	Colliding				Straight Ahead: Not Out Of Control				

Detailed Crash History

Road	Road Name	SLK	CWY	True Dist	Intersection	Date	Day	Time	Severity	Crash No.	Type	Light Cond	Road Cond	Speed Limit	Traffic Control	Road Feature	Road Alignment	Speed Factor	MR Nature	Location	RUM	Unit	Unit Type	From Dir	To Dir	Veh/Ped Move	First Object Hit	Second Object Hit	Third Object Hit	Target Impact Point
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	19/04/2022	Tuesday	1730	PDO Major	20222 05471	Intersection			70	No Sign Or Control	4-way Intx			Right Angle	On Cway	11:Intx: Thru - Thru	Target	Car			Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	28/05/2022	Saturday	1630	Medical	20222 74502	Intersection	Daylight	Dry	70	Stop Sign	3-way Intx (T-junction)	Straight		Right Angle	On Cway	14:Intx: Thru - Right	Colliding		E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	28/05/2022	Saturday	1630	Medical	20222 74502	Intersection	Daylight	Dry	70	Stop Sign	3-way Intx (T-junction)	Straight		Right Angle	On Cway	14:Intx: Thru - Right	Target	Car	S - KARGOTICH RD	E - THOMAS RD	Turning: To Make Right Turn				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	07/06/2022	Tuesday	1515	PDO Major	20222 62322	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx	Straight		Sideswipe Same Dirn	On Cway	38:Same Dirn: Parallel Lanes - Turn Right S/swipe	Colliding	Truck	S - KARGOTICH RD	E - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	07/06/2022	Tuesday	1515	PDO Major	20222 62322	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx	Straight		Sideswipe Same Dirn	On Cway	38:Same Dirn: Parallel Lanes - Turn Right S/swipe	Target	Car	S - KARGOTICH RD	N - KARGOTICH RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	20/09/2022	Tuesday	0640	Medical	20224 72311	Intersection	Daylight	Wet	70	Stop Sign	4-way Intx	Straight		Rear End	On Cway	31:Same Dirn: Same Lane Rear End	Colliding		S - KARGOTICH RD		Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	20/09/2022	Tuesday	0640	Medical	20224 72311	Intersection	Daylight	Wet	70	Stop Sign	4-way Intx	Straight		Rear End	On Cway	31:Same Dirn: Same Lane Rear End	Target	Utility	S - KARGOTICH RD		Stopped: To Avoid Veh				Rear
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	17/10/2022	Monday	0700	PDO Major	20224 82380	Intersection	Daylight	Dry	70	Give Way Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Colliding	Car	S - KARGOTICH RD	N - KARGOTICH RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	17/10/2022	Monday	0700	PDO Major	20224 82380	Intersection	Daylight	Dry	70	Give Way Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Target	Utility	E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	20/10/2022	Thursday	1645	Medical	20225 43022	Intersection	Daylight	Wet	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Colliding	Car	E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	20/10/2022	Thursday	1645	Medical	20225 43022	Intersection	Daylight	Wet	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Target	Car	S - KARGOTICH RD	N - KARGOTICH RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	06/11/2022	Sunday	1030	PDO Major	20225 20810	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Colliding	Car	E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	06/11/2022	Sunday	1030	PDO Major	20225 20810	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx	Straight		Right Angle	On Cway	11:Intx: Thru - Thru	Target	Four Wheel Drive (Not Car Design)	S - KARGOTICH RD	N - KARGOTICH RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	13/02/2023	Monday	0650	PDO Major	20233 79186	Intersection		Dry	70	Stop Sign	4-way Intx			Right Angle	On Cway	11:Intx: Thru - Thru	Colliding		E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	13/02/2023	Monday	0650	PDO Major	20233 79186	Intersection		Dry	70	Stop Sign	4-way Intx			Right Angle	On Cway	11:Intx: Thru - Thru	Target	Station Wagon	S - KARGOTICH RD	N - KARGOTICH RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	23/02/2023	Thursday	1630	PDO Major	20230 64050	Intersection	Daylight	Dry	70	Give Way Sign	4-way Intx			Right Angle	On Cway	11:Intx: Thru - Thru	Colliding	Panel Van	S - KARGOTICH RD	N - KARGOTICH RD	Straight Ahead: Not Out Of Control				

Detailed Crash History

Road	Road Name	SLK	CWY	True Dist	Intersection	Date	Day	Time	Severity	Crash No.	Type	Light Cond	Road Cond	Speed Limit	Traffic Control	Road Feature	Road Alignment	Speed Factor	MR Nature	Location	RUM	Unit	Unit Type	From Dir	To Dir	Veh/Ped Move	First Object Hit	Second Object Hit	Third Object Hit	Target Impact Point
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	23/02/2023	Thursday	1630	PDO Major	20230 64050	Intersection	Daylight	Dry	70	Give Way Sign	4-way Intx			Right Angle	On Cway	11:Intx: Thru - Thru	Target	Station Wagon	W - THOMAS RD	E - THOMAS RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	09/03/2023	Thursday	1535	PDO Minor	20230 90392	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx			Right Angle	On Cway	17:Intx: Thru - Left	Colliding	Car	E - THOMAS RD	S - KARGOTICH RD	Turning: To Make Left Turn				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	09/03/2023	Thursday	1535	PDO Minor	20230 90392	Intersection	Daylight	Dry	70	Stop Sign	4-way Intx			Right Angle	On Cway	17:Intx: Thru - Left	Target	Station Wagon	N - KARGOTICH RD	S - KARGOTICH RD	Straight Ahead: Not Out Of Control				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	31/03/2023	Friday	0700	PDO Major	20231 35763	Intersection		Wet	70	Stop Sign	4-way Intx			Rear End	On Cway	32:Same Dirn: Same Lane Left Rear	Colliding	Car	S - KARGOTICH RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	31/03/2023	Friday	0700	PDO Major	20231 35763	Intersection		Wet	70	Stop Sign	4-way Intx			Rear End	On Cway	32:Same Dirn: Same Lane Left Rear	Target	Car	S - KARGOTICH RD	W - THOMAS RD	Stopped: By Traffic Control				Rear
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	28/02/2024	Wednesday	1245	PDO Major	20241 07370	Intersection	Daylight	Dry	70	Give Way Sign	Roundabout			Head On	On Cway	21:Opposite Dirn: Head On	Colliding	Panel Van	E - THOMAS RD	W - THOMAS RD	Wrong Way / One Way Street				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	28/02/2024	Wednesday	1245	PDO Major	20241 07370	Intersection	Daylight	Dry	70	Give Way Sign	Roundabout			Head On	On Cway	21:Opposite Dirn: Head On	Target	Truck	W - THOMAS RD	E - THOMAS RD	Straight Ahead: Not Out Of Control				Front
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	08/03/2024	Friday	0415	PDO Major	20240 96671	Intersection		Dry	70	No Sign Or Control	Roundabout			Right Angle	On Cway	17:Intx: Thru - Left	Colliding	Four Wheel Drive (Not Car Design)	E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	08/03/2024	Friday	0415	PDO Major	20240 96671	Intersection		Dry	70	No Sign Or Control	Roundabout			Right Angle	On Cway	17:Intx: Thru - Left	Target	Four Wheel Drive (Not Car Design)	S - KARGOTICH RD	W - THOMAS RD	Turning: To Make Left Turn				Side
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	03/07/2024	Wednesday	0615	PDO Major	20243 08233	Intersection		Dry	70	Give Way Sign	Roundabout			Rear End	On Cway	32:Same Dirn: Same Lane Left Rear	Colliding	Car	E - THOMAS RD	S - KARGOTICH RD	Turning: To Make Left Turn				
H038	Thomas Rd	16.94	S	16.84	KARGOTICH RD (054070)	03/07/2024	Wednesday	0615	PDO Major	20243 08233	Intersection		Dry	70	Give Way Sign	Roundabout			Rear End	On Cway	32:Same Dirn: Same Lane Left Rear	Target	Station Wagon	E - THOMAS RD	W - THOMAS RD	Straight Ahead: Not Out Of Control				Front

EARLY WORKS – TRAFFIC MANAGEMENT PLAN

TONKIN HIGHWAY EXTENSION AND THOMAS ROAD UPGRADE PROJECT

Kargotich Road – Site Office Compound Layout.

Contract Number 179/18

Project Name:	Tonkin Extension Alliance (TEA)
Document Number:	TEA-00-TF-0110-PLN-0003
Client:	Main Roads Western Australia
Revision Date:	12/05/2025
Revision:	B

DETAILS OF [illegible] AMENDMENTS

I David Taylor (AWTM Cert No.STAP-AWTM-23-11544-06) declare that I have designed this Traffic Management Plan following a site inspection on 20/03/2025. The Traffic Management Plan prepared, **subject to the variations approved,** is in accordance with the Main Roads Code of Practice, AGTTM and AS 1742.3

Signature: ..... Date: 04/04/25

	Name / Company	Accreditation Details	Date	Signed
TMP designed by	strada road project consultants	STAP-23-11544-06	04/04/25	
TMP Reviewed by	strada road project consultants	STAP-23-11540-03	12/05/25	
RTM reviewed and Endorsed by	strada road project consultants	RTM #037	12/05/25	
Road Authority Review by				
Road Authority Authorisation	Road authority authorisation of the implementation of traffic signs and devices is given for Traffic Management Plan No. TEA-00-TF-0110-PLN-0003 Signed Authorised Officer Date (Print Name) Position			

TMP No TEA-00-TF-0110-PLN-0003	Rev. No. B	Date 12/05/2025

Revision	Revision Date	Comments	Section / Page No.	Revised By
A	04/04/25	Site Office Compound	N/A	N/A
B	12/05/2025	Revise TGS	Section 7.1 Pg 35	D.Taylor

Terms and Definitions

Term	Definition
The Alliance	Alliance means the Tonkin Extension Alliance (TEA) established for the Project.
Project Traffic Management Plan	The Project Traffic Management Plan refers to the main document that outlines methods and strategies the TEA adopts based on relevant documents and sources, for all works associated with temporarily modifying existing road conditions so construction works may take place. This will cover all items required in a “site specific” Traffic Management Plan as per Main Roads Code of Practice for traffic management either in detail or with methods for addressing in a Traffic Management Plan.
Traffic Management Plan	Traffic Management Plans are detailed plans for implementing specific traffic controls at specific locations and for prescribed times, with additional focus on overlapping activities and impact they may have on each other. They include all items required to be a Traffic Management Plan as per Main Roads Code of Practice and supplement the over.
Traffic Guidance Scheme	Traffic Guidance Scheme is a diagram showing the detailed layout of traffic control devices and is always part of a TMP.
Temporary Road Design	Temporary Road Design is a collection of design documentation that enables a temporary road or access track to be constructed on which traffic management devices can be installed as per the Traffic Guidance Scheme.
Short Term Traffic Management	Temporary traffic management is designed to generally utilise soft (cones or similar) and highly portable traffic management devices. Placed for a defined period usually measured in hours or a well-defined fixed number of days (e.g. off peak lane closure)
Long Term Traffic Management	Temporary traffic management is designed to generally function in a similar manner to permanent works, however built to a lower standard suitable for its intended design life and managed speed environment. This utilises hard (concrete or steel barriers) and partially fixed traffic management devices. Usually intended for a defined period measured in days, weeks or months (e.g. temporary traffic staging).
Vehicle Management Plan	Plan detailing movement of site vehicles from public roads onto site as well as movements within the site.

Glossary

Term	Definition
APT	Alliance Project Team, comprising BMD, Civcon Civil and Project Management, Georgiou Group, BG&E, and GHD and Main Roads WA personnel
AS	Australian Standards
BDC	Basis for Design and Construction
BIM	Building Information Modelling
CCIWA	Chamber of Commerce and Industry, WA
CoA	City of Armadale
CSE	Community and Stakeholder Engagement
C&SEP	Community and Stakeholder Engagement Plan
D&C	Design and Construct
DE	Digital Engineering
DfMA	Design for Manufacturing and Assembly
EMP	Environmental Management Plan
EPA	Environmental Protection Act
HR/IR	Human Resources and Industrial Relations
ISCA	Infrastructure Sustainability Council of Australia
ICNWA	Industry Capability Network, WA
KRA	Key Result Area
LGA	Local Government Authority
Main Roads	Main Roads WA, the Client
MRWA	Main Roads Western Australia, the Client
NOPs	Non-Owner Participants, being, BMD, Civcon Civil and Project Management, Georgiou Group, BG&E, and GHD.
OHS	Occupational Health and Safety
Our Subcontractors	The Tonkin Extension Alliance subcontractors
Our Suppliers	The Tonkin Extension Alliance suppliers

PAA	Project Alliance Agreement, the Contract
PMP	Project Management Plan
Project	The Tonkin Highway Extension Project, the Project
PTA	Public Transport Authority
PTMP	Project Traffic Management Plan
QMS	Quality Management System
RSMP	Railway Safety Management Plan
RFP	Request for Proposal
RNOC	Road Network Operations Centre
S&HMP	Safety and Health Management Plan
SME	Subject Matter Expert
SSJ	Shire of Serpentine-Jarrahdale
SPMT	Self-propelled modular transporters
SWTC	Based on the Main Roads template for Scope of Work and Technical Criteria
TEA	Tonkin Extension Alliance, the Alliance Project Team
TGS	Traffic Guidance Schemes
THE	The Tonkin Highway Extension Project, the Project
TMP	Traffic Management Plan

Contents

1. INTRODUCTION

1.1 Purpose and Scope

This Traffic Management Plan (TMP) outlines the traffic management controls to be implemented by The Tonkin Extension Alliance for the Project site office compound layout.

1.2 Objective and Strategies

The objectives of the Traffic Management Plan is to ensure:

- The safety of the road users accessing the site car park from Kargotich Road.
- The safety of the compound users whilst using the compound.

In an effort to meet these objectives this Traffic Management Plan will incorporate the following strategies:

- Providing a sufficient number of traffic lanes to accommodate vehicle volumes.
- Ensuring delays are minimised.
- Ensuring all road users are managed including motorists, pedestrians, cyclists, people with disabilities and people using public transport.
- Ensuring work activities are carried out sequentially to minimise adverse impacts.
- Provision will be made for works personnel to enter the work area in a safe manner in accordance with safety procedures.
- All entry and exit movements to and from traffic streams must be in accordance with the requirements of safe working practices.

2. PROJECT OVERVIEW

2.1 Location

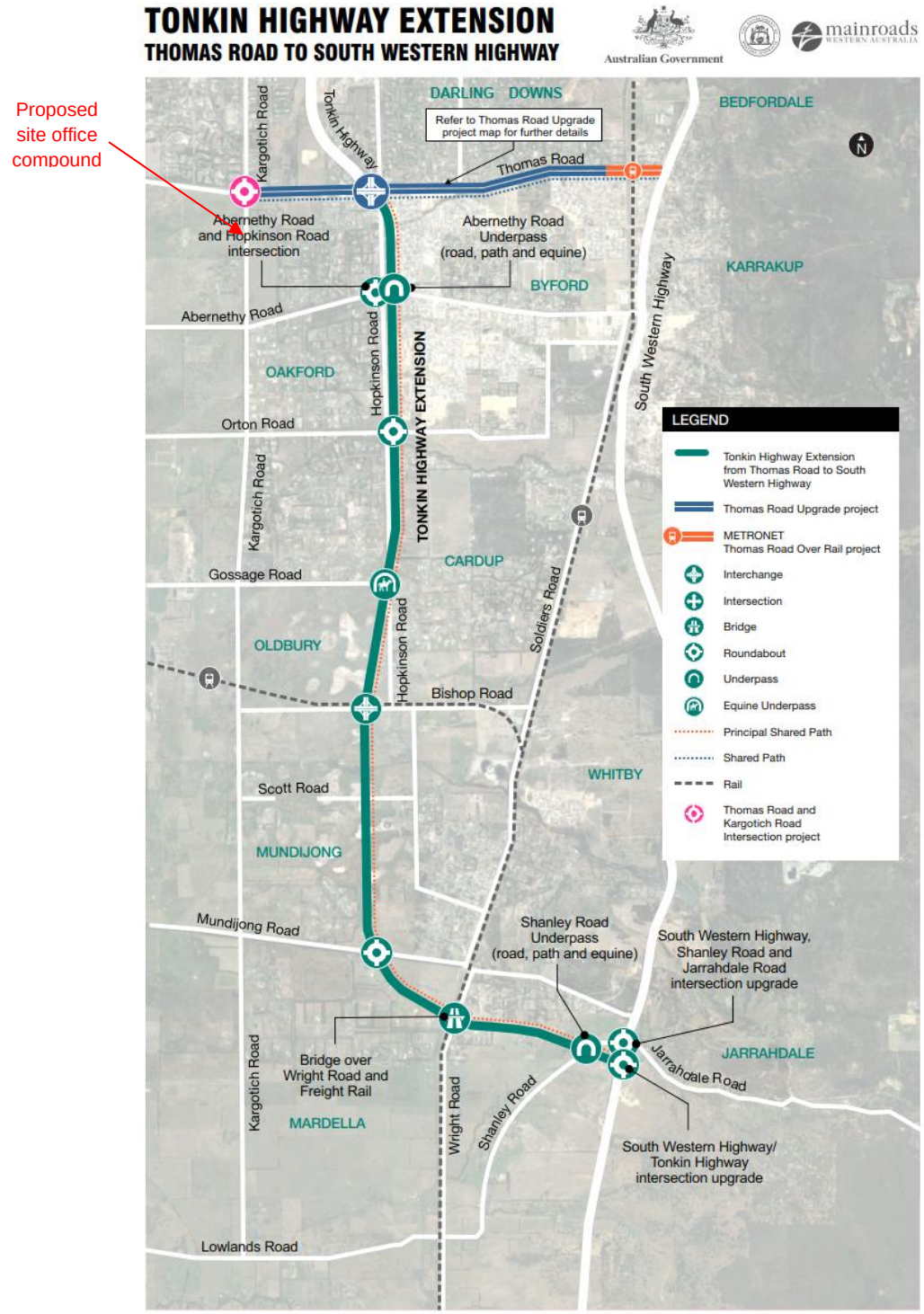


Figure 1A Site Location Sketch

Figure 1B Site Location Sketch

This TMP is applies to the location of the Project Site office located adjacent to the current service station development on Kargotich Road between Brahman Drive and Thomas Road, Oakford, Western Australia.

Figure 2 Site Visit Photo

2.2 Project Details, Site Assessment and Site Constraint /Impacts

ITEM	DESCRIPTION
Project	Tonkin Highway Extension Project – Thomas Road to South Western Highway. Site Office Compound establishment.
Location	Kargotich Road, between Thomas Road and Brahman Drive, Oakford, Western Australia.
Road Classification, Existing Speed Limit	Kargotich Road: Regional distributor, 70km/h – 90km/h
Road Authority	Main Roads WA
Local Government	Shire of Serpentine-Jarrahdale
Principal	Main Roads WA
Prime Contractor	Tonkin Extension Alliance

Sub-Contractor	Georgiou Group, BMD, CivCon Civil and Project Management, BG&E, GHD
Scope of Works	Specific to this TMP as part of the Tonkin Highway Extension Project: The Project site office compound establishment.
Staging of Work / Temporary Traffic Management	This TMP details the long term controls for the Project Site Office compound layout.
Project Date	May 2025 to December 2027
Hours / Days of Work	Monday to Saturday 7am to 7pm. Note: Works may occur outside of the approved work hours pending local government and Main Roads WA approval.
Duration of Work	The site office compound is required for the duration of the Tonkin Highway Extension Project. The site office compound will be removed at the completion of the Project.
Other Constraints	• Traffic volumes on Kargotich Road • Turning movements in close proximity to roundabout • Adjacent service station operations (future) • Noise to local residential properties.
Concurrent/adjacent Works or Projects	• Byford Rail Extension Project • Thomas Road Over Rail Project (Completed – maintenance and defects) • Kargotich Road upgrade & Service Station development (February 2025 to June 2025) - SSJ • Mundijong Road closure (April 2025 to June 2025) – City of Rockingham.
Traffic Volume and Composition	Kargotich Road: • NB daily total 2715 v/d • SB daily total 2893 v/d • Combined daily total 5608 v/d • NB am peak 392 v/h, NB pm peak 193 v/h • SB am peak 168 v/h, SB pm peak 457 v/h • Average percentage heavy vehicles 26.4%
Existing road configuration	Kargotich Road: Single lane each way carriageway
Existing pedestrian / cyclist facilities	Kargotich Road: There is no shared path along Kargotich Road. There is no sealed shoulder along the greater portion of Kargotich Road suitable for cycling.

2.3 Overview of Proposed TTM

ITEM	DESCRIPTION
Temporary Traffic Management Descriptions	This TMP includes traffic arrangements: • Long term modified road layout for site office compound.
Speed zone dates and times	No impacts to the long term speed zones are proposed in this TMP.
Lane Closures dates and times	No lane closures are proposed in this TMP.
Road Closures dates and times	No road closures are proposed in this TMP.
Signal modifications description	No modifications to road signals are proposed in this TMP.
Proposed lane widths	The proposed lane widths for the long term layout maintains 3.5m wide through lanes and proposed turning lanes.
Road Safety Barrier	There are no temporary road safety barriers detailed in this TMP. There are no existing road safety barriers modified as part of this TMP.

2.4 Project Representatives

POSITION	NAME	CONTACT DETAILS
Road Authority Representative	Main Roads WA - Steve Cole (OMTID)	
Local Government	Shire of Serpentine – Jarrahdale - James Carn	Shire of Serpentine – Jarrahdale 6 Paterson Street, Mundijong, WA, 6123 Ph: (08) 9526 1111 Email: jcarn@sjshire.wa.gov.au

Alliance Director (Prime Contractor)	Tonkin Extension Alliance - Peter Hopfmueller	Tonkin Extension Alliance 68 Hassler Road, Osborne Park, WA, 6017 Ph: 0427 003 602 Email: peter.hopfmueller@tonkinalliance.com.au
Construction Director (Prime Contractor)	Tonkin Extension Alliance - Kevin Garry	Tonkin Extension Alliance 68 Hassler Road, Osborne Park, WA, 6017 Ph: 0437 536 835 Email: kevin.garry@tonkinalliance.com.au
Traffic Manager (Prime Contractor)	Tonkin Extension Alliance - Alex Hoyo	Tonkin Extension Alliance 68 Hassler Road, Osborne Park, WA, 6017 Ph: 0498 805 988 Email: alex.hoyo@tonkinalliance.com.au
TMP Design	Strada Consultants - David Taylor	Strada Consultants Suite 10, 2 Hardy Street, South Perth, WA, 6151 Ph: 0439 900 764 Email: david.taylor@strada-rpc.com
TMP Implementation	Refer Tonkin Extension Alliance - Alex Hoyo	

Tonkin Extension Alliance have engaged Strada Consultants Pty Ltd to prepare this Traffic Management Plan and associated controls for the works.

The TMP will be implemented by the Tonkin Extension Alliance traffic management subcontractor (TBA) for TMP implementation provide registration number for state controlled roads

3. RISK MANAGEMENT

The following details the preliminary assessment of site hazards likely to be encountered, the level of risk associated with each and the control proposed. Note that the risk level is the level of assessed risk *without* the controls in place. The controls listed have been determined as being appropriate in reducing the risk to a level that is acceptable.

The hierarchy of control has been utilised to ensure that the highest practicable level of protection and safety is selected:

- Elimination
- Substitution
- Isolation
- Engineering
- Administration
- Personal Protection Equipment

In evaluating the options, a key consideration is whether the option takes traffic around, through or past the worksite.

3.1 Risk Classification Tables

QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT

Level	Consequence	Description
1	Insignificant	Mid-block hourly traffic flow per lane is equal to or less than the allowable lane capacity detailed in AGTTM. No impact to the performance of the network. Affected intersection leg operates at a Level of Service (LoS) of A or B. No property damage.
2	Minor	Mid-block hourly traffic flow per lane is greater than the allowable road capacity and less than 110% of the allowable road capacity as detailed in AGTTM. Minor impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of C. Minor property damage.
3	Moderate	Midblock hourly traffic flow per lane is equal to and greater than 110% and less than 135% of allowable road capacity as detailed in AGTTM. Moderate impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of D. Moderate property damage.
4	Major	Midblock hourly traffic flow per lane is equal to and greater than 135% and less than 170% of allowable road capacity as detailed in AGTTM. Major impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of E. Major property damage.
5	Catastrophic	Midblock hourly traffic flow per lane is equal to and greater than 170% of allowable road capacity as detailed in AGTTM. Unacceptable impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of F. Total property damage.

WHS QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT

Level	Consequence	Description
1	Insignificant	No treatment required
2	Minor	First aid treatment required.

3	Moderate	Medical treatment required or Lost Time Injury
4	Major	Single fatality or major injuries or severe permanent disablement
5	Catastrophic	Multiple fatalities.

QUALITATIVE MEASURES OF LIKELIHOOD

Level	Likelihood	Description
A	Almost certain	The event or hazard: is expected to occur in most circumstances, will probably occur with a frequency in excess of 10 times per year.
B	Likely	The event or hazard: Will probably occur in most circumstances, will probably occur with a frequency of between 1 and 10 times per year.
C	Possible	The event or hazard: might occur at some time, will probably occur with a frequency of 0.1 to 1 times per year (i.e. once in 1 to 10 years).
D	Unlikely	The event or hazard: could occur at some time, will probably occur with a frequency of 0.02 to 0.1 times per year (i.e. once in 10 to 50 years).
E	Rare	The event or hazard: may occur only in exceptional circumstances, will probably occur with a frequency of less than 0.02 times per year (i.e. less than once in 50 years).

IMPORTANT NOTE: The likelihood of an event or hazard occurring must first be assessed over the duration of the activity (i.e. "period of exposure"). For risk assessment purposes the assessed likelihood must then be proportioned for a "period of exposure" of one year.

Example: An activity has a duration of 6 weeks (i.e. "period of exposure" = 6 weeks). The event or hazard being considered is assessed as likely to occur once every 20 times the activity occurs (i.e. likelihood or frequency = 1 event/20 times activity occurs = 0.05 times per activity). Assessed annual likelihood or frequency = 0.05 times per activity x 52 weeks/6 weeks = 0.4 times per year. Assessed likelihood = Possible.

QUALITATIVE RISK ANALYSIS MATRIX – RISK RATING

	CONSEQUENCE				
Likelihood	**Insignificant (1)**	**Minor (2)**	**Moderate (3)**	**Major (4)**	**Catastrophic (5)**
Almost certain (A)	**Low 5**	**High 10**	**High 15**	**Very High 20**	**Very High 25**
Likely (B)	**Low 4**	**Medium 8**	**High 12**	**Very High 16**	**Very High 20**
Possible (C)	**Low 3**	**Low 6**	**Medium 9**	**High 12**	**High 15**
Unlikely (D)	**Low 2**	**Low 4**	**Low 6**	**Medium 8**	**High 10**
Rare (E)	**Low 1**	**Low 2**	**Low 3**	**Low 4**	**Medium 7**

MANAGEMENT APPROACH FOR RESIDUAL RISK RATING

Residual Risk Rating	Required Treatment
Very High	Unacceptable risk. **HOLD POINT**. Work cannot proceed until risk has been reduced.
High	High priority, WHS MR and Roadworks Traffic Manager (RTM) must review the risk assessment and approve the treatment and endorse the TGS prior to its implementation.
Medium	Medium Risk, standard traffic control and work practices subject to review by accredited AWTM personnel prior to implementation.
Low	Managed in accordance with the approved management procedures and traffic control practices.

3.2 Risk Register

Generic Risks

Item	Risk Event	Consequence	Pre-treatment Risk			Treatment	Residual Risk			TMP/TGS Reference
			L	C	RR		L	C	RR	
1	Traffic flows (speed and volumes) may create a risk of collision with other vehicles on the road, pedestrians, construction vehicles and construction personnel.	Injury to road users and work personnel.	C	4	H12	Temporary speed zones to be implemented approaching and passing the works.	E	3	L3	All TGS
2	Incorrectly designed and / or installed traffic control may result in inadequate protection of the worksite with a subsequent increased potential for crashes and injury.	Potential injury to road users.	C	3	M9	Qualified and experienced personnel have been employed in the preparation of the TMP and associated TGSs and experienced personnel will be used to implement and maintain the traffic control onsite.	E	3	L3	All TGS / TMP cover page declaration
3	Weather conditions may result in a decreased readability of the traffic	Injury to road users.	D	3	L6	The TMP requires that the Contractor undertakes a daily inspection of the traffic	E	3	L3	Section 5.1.1 of TMP

Item	Risk Event	Consequence	Pre-treatment Risk			Treatment	Residual Risk			TMP/TGS Reference
			L	C	RR		L	C	RR	
	control delineation and signage and may increase the potential for crashes.					control and make adjustments as are necessary to ensure effectiveness is maintained. Experienced personnel specialising in the erection and maintenance of traffic control will be used. All signage shall be Class 1 retro-reflective.				

Site Specific Risks

Item	Risk Event	Consequence	Pre-treatment Risk			Treatment	Residual Risk			TMP/TGS Reference
			L	C	RR		L	C	RR	
1	Vertical and Horizontal curves (geometry) limits sight distance to work area and traffic management devices resulting in a collision	Injury to road users. Injury to work personnel	B	4	H12	Prepare TGS following site review. Adjust sign spacing and stopping locations as required to provide increased visibility to the drivers	D	4	M8	TGS & Section 5.1.4 of TMP
2	Vehils collision occurs in the car park due to inattentive drivers	Property damage	C	3	M9	Single direction of flow in car park. Reverse parking to be enforced.	D	3	L6	TGS
3	Side on collision occurs as vehicles exit the site compound onto Kargotich Road	Injury to road users	C	3	M9	Left turn movements only at exit. (New Roundabout to be used to travel south bound on Kargotich Road	D	3	L6	TGS

4. TRAFFIC MANAGEMENT PLANNING AND ASSESSMENT

4.1 Traffic Assessment and Analysis

4.1.1 Traffic and Speed Data

A summary of recent traffic data is provide below:

Location	Vehicles per day (% heavy vehicles)	Date	Source
Kargotich Road	26.4%	2023/2024	Traffic Map

A summary of recent speed data is provided below:

Location	Posted Speed (km/h)	85th Percentile Speed (km/h)	Date	Source
Kargotich Road	70 – 90	NB 99.6 (90) SB 88.2 (90)	2023/2024	Traffic Map

4.1.2 Traffic Flow Analysis

This traffic management plan details the long term control. Depending on the time of day, Kargotich Road is a low to medium volume single lane each way road. The site compound establishment will have a low impact on Kargotich Road as the road currently has a combined peak flow of 650v/h. A single lane will be maintained in each direction on Kargotich Road, with turn pockets installed for right turning traffic in the south bound direction.

4.1.3 Temporary Speed Zones

There is no adjustment to the existing speed zones in this TMP

4.1.4 Existing Traffic signals

There is no impact on traffic signals in this TMP

4.1.5 Impact to adjoining network

There is no notable impact on the adjoining road network in this TMP.

4.1.6 End of Queue Treatment

There is no end of queue treatment required in this TMP.

4.1.7 Portable Traffic Control Devices (PTCDs)

There are no PTCDs required in this TMP

4.1.8 Speed Management

There is no speed management required in this TMP. It is noted that the future roundabout to the north of the proposed site office driveways will induce a natural speed drop on approach to the site office compound due to the geometric nature of roundabout controls.

4.1.9 Excavations or Above Ground Hazards

There are no excavation treatments required in this TMP.

4.2 Road Users

This TMP covers a number of varying rod types with varying existing infrastructure. Some of the varying road users using the road corridors across the Project include:

- Pedestrians
- Cyclists / Electric scooters and bicycles
- Equestrian
- Public Transport
- Motorised vehicles
- Heavy vehicles

4.2.1 Pedestrians

There is no impact on pedestrians in this TMP

4.2.2 Cyclists

There is minimal impact on cyclists in this TMP however it is noted that Kargotich Road future sealed shoulder widening will be used to realign Kargotich Road to create sufficient space for the turning pockets. This may compromise the available space for cyclists locally around the site office driveways, however, it is noted that for the significant majority of Kargotich Road as width the most surrounding roads on the road network, there is generally no sealed shoulder for cyclists to cycle.

4.2.3 Public Transport

The Public Transport Authority network is not impacted by the works in this TMP.

4.2.4 Heavy and Oversized Vehicles

There is no impact on the heavy haulage network as a result of the long term controls detailed in this TMP.

4.2.5 Existing Parking Facilities

There are no existing parking facilities along any of the Projects road network.

4.2.6 Access to Adjoining Properties / Business

Access to all adjoining properties shall be maintained.

4.2.7 Rail Crossings

There are no rail crossings impacted in this TMP.

4.2.8 School Crossings

There are no school crossings that will be impacted in this TMP.

4.2.9 Special Events and Other Works

The Project is long term in nature. The Project Community and Stakeholder Management representatives will liaise with the Shire of Serpentine-Jarrahdale and the City of Armadale local governments regarding local events.

There are no arrangements that have significant or broad spanning impact across the road network. The short term arrangements detailed in this TMP are unlikely to impact any special events.

4.2.10 Emergency Vehicle Access

Emergency vehicles are not anticipated to be impacted by the long term site project office arrangement.

4.3 Night Work Provisions

Where existing street lighting exists, street lighting shall be maintained under this TMP.

Traffic controllers shall ensure all signs and devices are suitable for night time provisions with class 1A reflective material.

Traffic controllers shall wear appropriate Project approved night works garments and vests that meet the requirements of OH&S Australian Standards.

When working at night around residential premises, noise disturbance from machinery and construction activities will likely become a significant inconvenience to residents nearby. Every attempt shall be made to limit the working hours of noisy activities at night or seek alternative methods or devices to achieve the completion of the works. All vehicles working at night shall be fitted with a reversing croaker in lieu of a reversing beeper.

4.4 Road Safety Barriers

There are no temporary road safety barriers detailed in this TMP.

4.5 Shadow Vehicles

Shadow vehicles are not required in this TMP.

4.6 Consultation and Communication / Notification

4.6.1 Other Agencies

The Project Traffic Manager shall conduct regular meetings with the impacted local government authority representatives at the Shire of Serpentine-Jarrahdale, and the City of Armadale. The Project Community and Stakeholder representatives shall also advise of coming works that may impact the relevant LGA's.

4.6.2 Public

The public must be notified of the works and traffic management arrangements which will effect journey times as deemed appropriate by the Project Community and Stakeholder Management Plan. This communication may be done by way of:

- Letter drop to all residents and businesses within the traffic control zone one week ahead of the scheduled works; and,
- VMS boards during the works.
- Social media notifications.

5. SITE ASSESSMENT

5.1 Provision to Address Environmental Conditions

5.1.1 Adverse Weather

Weather is not expected to adversely impact on the effectiveness of the traffic control detailed on the attached TGS's. Notwithstanding this, should adverse weather conditions be encountered during the works, the following contingency plans should be activated. Note: any adjustments to the plan must be risk assessed and approved by someone holding a WTM or AWTM accreditation. Major changes will require road authority approval.

5.1.1.1 Rain

In the event of rain, an on-site assessment must be made and sign spacing and tapers may be extended by 25% to account for increased stopping distances.

If rain occurs, Traffic Management Personnel must inspect the site and where signage and / or devices are not clearly visible, signage may need to be adjusted to improve visibility or if necessary provide additional signage and delineation. Where stopping distances are adversely affected by wet surfaces, spacing between signs may need to be adjusted to provide increased reaction time for drivers. In cases where it is determined that the rain is so heavy that the risk is considered unacceptable, all work must cease until rain has cleared. All changes must be noted in the daily diary.

5.1.1.2 Floods

Should works be affected by flooding to the extent that the worksite becomes impassable or risk is considered unacceptable, all work must cease immediately and Traffic Controllers (and other personnel if necessary) must be deployed immediately to close the site and direct traffic around the flooded area (under the direction of the project manager or traffic manager). Emergency services and the Road Authority must be notified immediately and Traffic Controllers must remain onsite until emergency services and the Road Authority personnel arrive and take control of the site.

5.1.1.3 Other adverse weather (strong winds, thunder storms, etc.)

Should work be required to continue through periods of strong winds, the traffic controllers shall ensure all signs and devices are appropriately weighted and displayed. Should the signs not be able to be maintained, the works are to cease and the traffic management removed.

5.1.2 Sun Glare

Where sun glare is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, sign locations may need to be adjusted and additional delineation and/or traffic control devices provided to address the risk from glare. Additionally, in the event that traffic control is adversely affected by glare at sunset and sunrise, traffic controllers may need to assist in maintaining low traffic speeds.

All changes are to be noted in the daily diary.

5.1.3 Fog, Dust and Smoke

Where fog, dust or smoke is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, sign locations may need to be adjusted and additional delineation and/or traffic control devices provided to address the risk. All changes are to be noted in the daily diary.

Should works be affected by fog, dust or smoke to the extent that risk is considered unacceptable, all work must cease immediately and Traffic Controllers (and other personnel if necessary) must be deployed immediately to close the site.

5.1.4 Road Geometry, Terrain, Vegetation and Structures

This TMP is site wide and covers a variety of road configuration with varying geometry with both horizontal and vertical curves. The northern and central sections of the Project are typically flat in nature with long sweeping curves that offer good lines of sight. At the southern end of the Project, particularly on South West Highway and Jarrahdale Road, there is changing relatively steep vertical grades and rolling curves. The traffic management has been placed that drivers have a good line of sight to the advanced signage with an appropriate drop in speed before the work area.

There are road safety barriers and other similar such obstructions across the Project road network, particularly along Thomas Road. When there are existing obstructions (e.g. barriers), escape routes (or lack thereof) for traffic management workers must be considered. This must be considered when determining signs and device locations and where required a lookout person must utilised.

5.2 Existing Traffic and Adverting Signs

The existing traffic signage shall be maintained unless it directly conflicts with the short term arrangement and is noted to be covered on the plan.

There is no advertisement signage of note on the Project Road network. Should the advertising signage be required to be relocated of removed, the business will be notified by the Project Community and Stakeholder Management representatives.

6. SAFETY PLAN

6.1 Work Health and Safety

All persons and organisations undertaking these works or using the roadwork site have a duty of care under statute and common law to themselves, workers and all site users, lawfully using the site, to take all reasonable measures to prevent accident or injury.

This TMP forms part of the Project Safety Management Plan, and provides details on how all road users considered likely to pass through, past, or around the worksite will be safely and efficiently managed for the full duration of the site occupancy and works.

6.2 Roles and Responsibilities

6.2.1 Responsibilities

The Alliance Director has the ultimate responsibility to ensure the TMP is implemented for the prevention of injury and property damage to employees, contractors, sub-contractors, road users and all members of the public.

The Alliance Director will ensure all site personnel are fully aware of their responsibilities, and that Traffic Controllers are appropriately trained and accredited and that sufficient controllers are available to ensure appropriate breaks are taken.

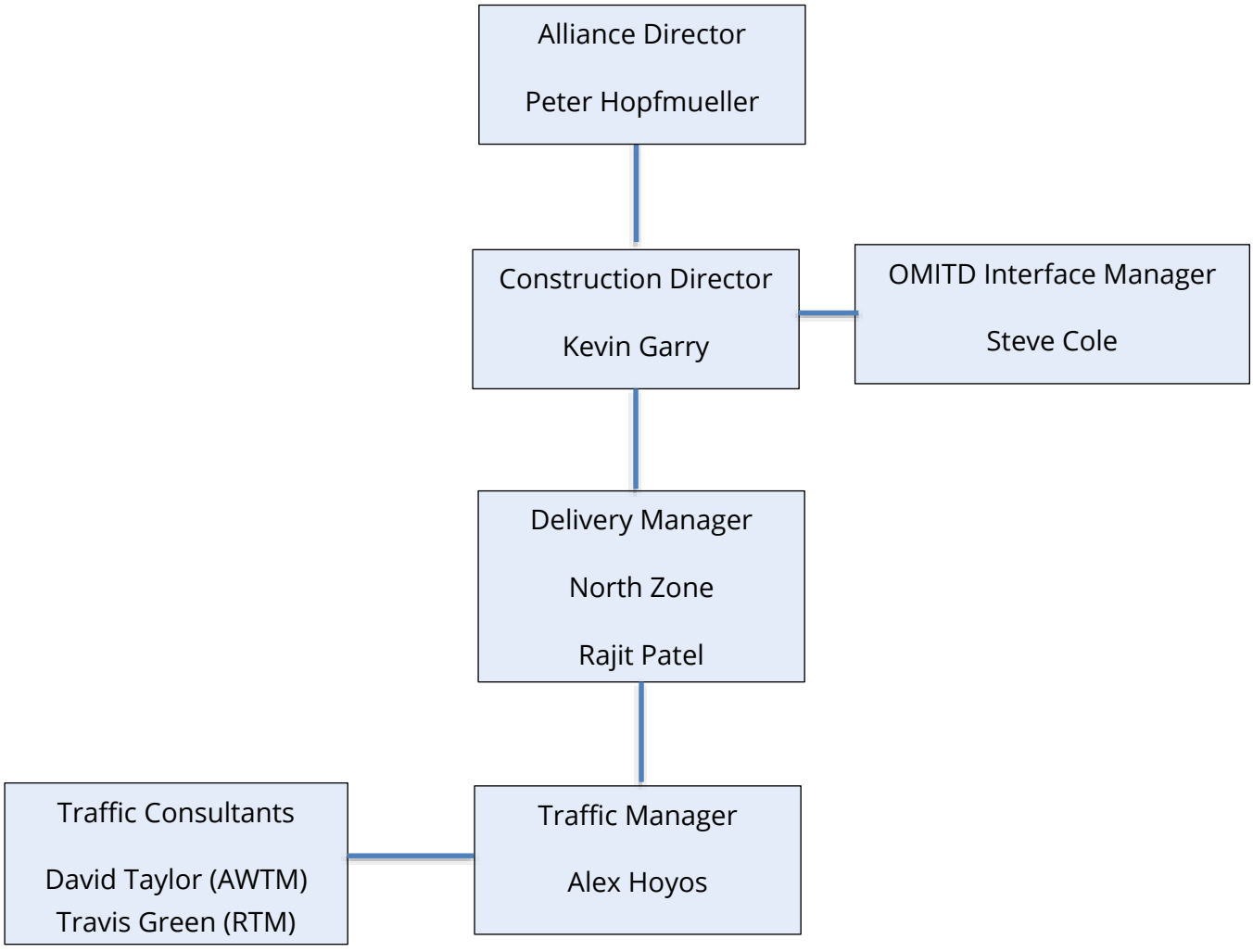
All personnel engaged in the field activities will follow the correct work practices as required by the CoP, AGTTM and AS1742.3.

All personnel will not commence or continue work until all signs, devices and barricades are in place and operational in accordance with the requirements of the TMP.

All personnel responsible for temporary traffic management must ensure that the number, type and location of signs, devices and barricades are to a standard not less than Appendix F of this plan, CoP, AGTTM and AS1742.3 (except where specifically detailed in this TMP with reasons for the variations). Should a situation arise that is not covered by this TMP, CoP, AGTTM or AS1742.3, the Road Authority Representative must be notified.

6.2.2 Roles

The following diagram outlines the responsibility hierarchy of this worksite.



6.2.2.1 Alliance Director

The alliance director must:

- Ensure all traffic control measures of this TMP are placed and maintained in accordance with this plan and the relevant Acts, Codes, Standards and Guidelines

6.2.2.2 Construction Manager

The construction manager must:

- Enure the responsibilities of the alliance director have been managed across the Construction team, including the traffic manager and traffic controllers
- Ensure all traffic control measures of this TMP are placed and maintained in accordance with this plan and the relevant Acts, Codes, Standards and Guidelines
- Ensure suitable communication and consultation with the affected stakeholders is maintained at all times
- Ensure the traffic manager is implementing the traffic plan and the risks are managed accordingly.

6.2.2.3 Site Supervisor

The site supervisor is responsible for overseeing the day-to-day activities, and is therefore responsible for the practical application of the TMP, and must:

- Instruct workers on the relevant safety standards, including the correct wearing of high visibility safety vests
- Ensure traffic control measures are implemented and maintained in accordance with the TMP
- Work with the Traffic Management Supervisor to ensure the correct TGS is selected for the work activity
- Undertake and submit the required inspection and evaluation reports to management
- Render assistance to road users and stakeholders when incidences arising out of the works affect the network performance or the safety of road users and workers
- Take appropriate action to correct unsafe conditions, including any necessary modifications to the TMP.

6.2.2.4 Traffic Manager

The Traffic Manager is responsible for the practical application of the Traffic Management devices and workers in accordance with the appropriate Traffic Guidance Schemes, AGTTM, Main Roads Code of Practice and AS 1742.3.

- Traffic management sites involving 'complex traffic arrangements' on Main Roads controlled roads, must have at least one person with either Worksite Traffic Management or Advanced Worksite Traffic Management accreditation on-site at all times when road workers are present.
- At least one person accredited in Advanced Worksite Traffic Management must be available to attend the site at short notice at all times to manage variations, contingencies and emergencies, and to take overall responsibility for traffic management.

The Traffic Management Supervisor is responsible for the following:

- Work with the Site Supervisor to ensure the correct TGS is selected for the work activity
- Prior to any implementation activities on site the Traffic Management Supervisor must execute all actions outlined in the Austroads Guide to Temporary Traffic Management Part 6, Field Staff – Implementation and Operations.
- Ensuring the Traffic Management devices are set out in accordance with the Traffic Guidance Schemes, AGTTM and Main Roads Code of Practice.
- Ensure that the quality and quantity of Traffic Management devices matches the relevant Traffic Guidance Scheme, Main Roads Code of Practice and AS 1742.3.
- Have all relevant qualifications, including Worksite Traffic Management for complex Traffic Management arrangements on State Roads.
- Must be on site to manage adjustments, modifications, contingencies and emergencies and take overall responsibility for the implemented Traffic Management setups.
- Where changes are required to complex Traffic Management arrangements, the Traffic Management Supervisor must risk assess those changes and record variations in the Daily Diary. Where an RTM is not consulted, all changes must be within the original scope and objectives of the proposed Traffic Guidance Schemes. All other changes must be endorsed by the RTM and must be authorised by the Road Infrastructure Manager.
- Ensure there is a copy of the approved Traffic Management Plan, including all associated Traffic Guidance Schemes is available on site at all times.

6.2.2.5 Traffic Management Workers

- At least one person on site must be accredited in Basic Worksite Traffic Management, and must have the responsibility of ensuring the traffic management devices are set out in accordance with the TMP.

6.2.2.6 Traffic Controllers

Traffic Controllers must be used to control road users to avoid conflict with plant, workers, traffic and pedestrians, and to stop and direct traffic in emergency situations.

Traffic Controllers must:

- Operate in accordance with AGTTM Part 7: Traffic Controllers
- Be accredited in Basic Worksite Traffic Management
- Hold a current Traffic Controller's accreditation
- Be relieved from their duty after not more than 2 hours for a period of rest or "other duties" of at least 15 minutes as required by AGTTM Part 7.

6.2.2.7 Workers and Subcontractors

Workers and Subcontractors must

- Correctly wear high visibility vests, in addition to other protective equipment required (e.g. footwear, eye protection, helmet sun protection etc.), at all times whilst on the worksite
- Comply with the requirements of the TMP and ensure no activity is undertaken that will endanger the safety of other workers or the general public
- Enter and leave the site by approved routes and in accordance with safe work practices

6.3 Personal Protective Equipment (PPE)

All personnel entering the work site must correctly wear high visibility vests to AS/NZS 4602, in addition to other protective equipment required by the Project Safety Management Plan. (e.g. protective footwear, eye protection, helmet, sun protection, respiratory devices, high visibility clothing etc.) at all times whilst on the worksite.

6.4 Plant and Equipment

All plant and equipment at the workplace must meet statutory requirements and have the required registration, licences or certification where required. All mobile equipment must be fitted with suitable reversing alarms. All mobile plant and vehicles must be fitted with a pair of rotating flashing yellow lamps in accordance with AS1742.3 clause 4.14.1. All workers will be made aware of the safe work practice at the time of the site induction.

6.5 Trip Hazards

The worksite and its immediate surroundings must be suitably protected and free of hazards, which could result in tripping by cyclists or pedestrians. Hazards, which cannot be removed, must be suitably protected to prevent injury to road users, including those with sight

impairment. Where level differences are significant, suitable barriers, which preclude pedestrian access must be used.

Where works extend beyond daylight hours and adjacent lighting is insufficient to illuminate hazards to cyclists or pedestrians, appropriate temporary lighting must be installed.

The worksite must be kept tidy to reduce the risk to workers.

7. IMPLEMENTATION

7.1 Traffic Guidance Schemes

The Traffic Guidance Scheme (TGS) outlined in Appendix F and listed below have been provided for the following stages to demonstrate the type of controls that will be implemented throughout the term of the contract. All sign and device requirements are shown on each TGS. Should the use of additional (not shown on the TGS or listing of devices) or reduced number of devices be required due to unforeseen needs, they must be recorded within the Daily Diary as a variation to the TMP, following prior approval.

TGS Number	Revision	Details
TEA-00-TF-0110-DWG-3000	0	Tonkin Highway Extension Project: Generic Short Term: Site Office Compound – Long Term Layout. Sheet 1 of 2
TEA-00-TF-0110-DWG-3001	1	Tonkin Highway Extension Project: Generic Short Term: Site Office Compound – Long Term Layout. Sheet 2 of 2
TEA-00-TF-0110-DWG-3002	1	Tonkin Highway Extension Project: Generic Short Term: Site Office Compound – Swept Path Layout. Sheet 1 of 1

7.2 Sequence and Staging

The sequence of temporary traffic management installation, work activities and temporary traffic management removal are shown in the table below.

Step	Details
	Single Lane Carriageway Or Low Speed Dual Carriageway
1	Construct Long term site office compound access.
2	Remove site office compound access.
3	Restore existing road to the satisfaction of the Shire of Serpentine – Jarrahdale.

7.3 Traffic Control Devices

7.3.1 Sign Requirements

All signs used must conform to the designs and dimensions as shown in Australian Standard AS 1742.3, AGTTM and the CoP.

Prior to installation, all signs and devices must be checked by the Site Supervisor or a suitably qualified person to ensure that they are in good condition and meet the following requirements:-

- Mechanical condition - Items that are bent, broken or have surface damage must not be used.
- Cleanliness - Items should be free from accumulated dirt, road grime or other contamination.
- Colour of fluorescent 0signs - Fluorescent signs whose colour has faded to a point where they have lost their daylight impact must be replaced.
- Retroreflectivity. - Signs used for night-time or in low light conditions whose retroreflectivity is degraded either from long use or surface damage and does not meet the requirements of AS 1906 must be replaced.
- Battery operated devices - must be checked for lamp operation and battery condition.

Where signs do not conform either to the requirements of AS 1742.3 or would fail to pass any of the above checks, they must be replaced on notice.

Signs and devices must be positioned and erected in accordance with the locations and spacing's shown on the drawings. All signs must be positioned and erected such that:

- They are properly displayed and securely mounted;
- They are within the driver's line of sight;
- They cannot be obscured from view;
- They do not obscure other devices from the driver's line of sight;
- They do not become a possible hazard to workers or vehicles; and
- They do not deflect traffic into an undesirable path.

Signs and devices that are erected before they are required must be covered by a suitable opaque material. The cover must be removed immediately prior to the commencement of work.

Where there is a potential for conflict of information between existing signage and temporary signage erected for the purpose of traffic control, the existing signs must be covered. The material covering the sign must ensure that the sign cannot be seen under all conditions i.e. day, night and wet weather. Care will be taken to ensure existing signs are not damaged by the covering material or by adhesive tape.

7.3.1.1 Securing Signs and Devices

The short term signage shall be weighted appropriately using sand bags or similar devices in windy conditions.

750mm traffic cones may be double stacked to provide additional weight. Similarly, heavier 900mm traffic cones can be used to also provide improved delineation.

7.3.2 Tolerances on positioning of signs and devices

Where a specific distance for the longitudinal positioning of signs or devices with respect to other items or features is stated, for the spacing of delineating devices or for the length of tapers or markings, the following tolerances may be applied: -

(a) Positioning of signs, length of tapers or markings:

(i) Minimum, 10% less than the distances or lengths given.

(ii) Maximum, 25% more than the distances or lengths given.

(b) Spacing of delineating devices:

(i) Maximum, 10% more than the spacing shown.

(ii) No minimum.

These tolerances must not apply where a distance, length or spacing is already stated as a maximum, a minimum or a range.

7.3.3 Flashing Arrow Signs

Where flashing arrow signs are required to better delineate lane tapers, these signs will comprise a matrix of lamps or light emitting elements in the form of an arrow that is flashed in a cyclical manner to provide advance warning. The sign shall have a minimum dimension of 2400mm. x 1200mm. and conform to the requirements of AS/NZS 4192. The Site Traffic Manager shall ensure that all equipment used meets the Australian Standard.

7.3.4 Delineation and Edge Clearance

Temporary frangible or otherwise non-hazardous delineator posts, bollards or cones may be used for edge protection and taper delineation.

Posts or bollards shall be suitable for use as temporary lane separators between through traffic lanes.

Temporary posts or bollards must be capable of being fixed to the road pavement by a suitable road adhesive or by fastening bolts or spikes. Fixing shall be in accordance with manufacturer's recommendations.

Posts and bollards shall be fitted with suitable white retro-reflective tape placed in accordance with AS 1742.3.

All posts or bollards will be inspected daily and where displaced or missing made good as per the temporary maintenance criteria.

If adhesive is used to affix the posts this shall be completely removed from the road surface so that a flush surface is obtained.

All bollards and post type delineators shall be placed at the maximum spacing according to the table below:

Delineator Type	Purpose and Usage	Spacing
Cones, Bollards and Post Type delineators	Edge delineation adjacent to widening and reconstruction	12m
	Merge tapers	9m
	Lateral Shift tapers	12m
	Spacing for all purposes in 40km/h zone	4m

7.4 Site Access for Work Vehicles

Operator of vehicles requiring to drive on site must have a permit to do so as detailed in the Project induction.

Vehicles entering and exiting the traffic stream do so in an environment that is different from normal driving situations, and as such drivers need to be mindful of the conditions that may affect the safety of these movements.

All vehicles movements into and out of site onto existing road networks must be in accordance with the developed TMPs. All entry and exit movements will be in accordance with the Road Traffic Code and shall be undertaken in the following manner:

a) Access points shall be notified to all works personnel and suppliers and clearly designated on Traffic Guidance Schemes

b) As 'following' drivers would not commonly expect 'leading' vehicles to leave the roadway, their attention may be reduced. In recognition of this, drivers travelling along the road way requiring to enter site at a designated site entry location or pull over onto the verge shall:
    - Activate the vehicle's rotating amber lamp
    - Indicate accordingly their intent to turn off the roadway using their indicator
    - Slowly decelerate on approach to the site entry
    - Call up on the nominated (sign posted) UHF channel that they are entering site as to advise personnel and construction vehicles around the site entry location.
    - Proceed to turn into site.

c) Vehicles entering the roadway from the verge or designated site entry location shall:
    - Already have rotating amber lamp on
    - Call up on the nominated (sign posted) UHF channel that they are leaving site as to advise any construction vehicles approaching the site entry location
    - Indicate their direction of travel.
    - Stop at the site exit location prior to entering the roadway
    - Ensure they have a clear line of site to approaching vehicles travelling along the roadway in both directions.
    - When safe to do so, proceed to enter the roadway.
    - Turn rotating amber light off when they have reached the road operating speed.

Gate persons may be used, where required, to assist vehicles entering the traffic stream from the work site. When traffic controllers are used, the contractor shall ensure that all required signage has been installed; traffic controllers follow

7.5 Communicating TMP Requirements

The TMP should be reviewed by the Traffic Manager and the Traffic Management Supervisor prior to the day of implementation. Such that prior planning and preparation of devices required is thorough.

The TMP shall be communicated to all personnel involved in the traffic management and work at prestart.

The traffic controllers shall develop a procedure to communicating using UHF two way communication devices.

8. EMERGENCY ARRANGEMENTS AND CONTINGENCIES

8.1 Traffic Incident Procedures

In the event of an incident or accident, whether or not involving traffic or road users, all work must cease and traffic must be stopped as necessary to avoid further deterioration of the situation. First Aid must be administered as necessary, and medical assistance must be called for if required.

Road plant within the work area that may impact on any services requiring access to a crash site will be cleared from the area quickly as necessary.

8.1.1 Serious Injury or Fatality

In the case of serious injury or fatality occurring within the traffic management site all work must cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) must be deployed immediately to ensure no traffic or other road users approach the area.

An Ambulance and Police must be called on telephone number 000 where life threatening injuries are apparent.

All road workers and traffic management personnel must preserve the scene leaving everything in situ, until direction is given by Police or WorkSafe.

A site specific detour route and/or road closure point will be determined, signed and controlled by traffic management personnel and advised to Police, who will take charge of the site upon arrival. Detour routes will be determined so as to cater for all types of vehicles required to use them. An example of how to manage an emergency can be found in Section 5 of AGTTM Part 10.

All site personnel must be briefed on control procedures covering incidents and crashes that result in serious injury or fatalities.

If it is determined that a road closure point is required on the street of works, a detour route shall be determined prior to the commencement of works by the traffic manager and traffic supervisor.

8.1.2 Minor Incident or Vehicle Break Down within Site

Broken down vehicles and vehicles involved in minor non-injury crashes must be temporarily moved to the verge as soon as possible after details of the crash locations have been gathered and noted. Where necessary to maintain traffic flow, vehicles must be temporarily moved into the closed section of the work area behind the cones, providing there is no risk to vehicles and their occupants or workers. Suitable recovery systems must be used to facilitate prompt removal of broken down or crashed vehicles. Assistance must be rendered to ensure the impact of the incident on the network is minimised.

Any traffic crash resulting in non-life threatening injury must be reported to the WA Police Service on 131 444.

Details of all incidents and accidents must be reported to the Site Supervisor and Project Manager using the incident report form at Appendix “C” (or similar).

8.2 Emergency Services

Emergency services must be notified of the proposed works nature, location, date and times as well as contact details for the site supervisor.

On-site traffic controllers will be equipped with mobile communications to advise and/or liaise with emergency services to ensure a prompt response should the need arise.

8.3 Dangerous Goods

Should any incident arise involving vehicles transporting dangerous goods, all work must cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) must be deployed immediately to ensure no traffic or other road users approach the area.

Emergency services must be notified of the proposed works nature, location, date and times as well as contact details for the site supervisor. All site personnel must be briefed on evacuation and control procedures.

8.4 Damage to Services

In the event that gas services are damaged, all work must cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) must be deployed immediately to ensure no traffic or other road users approach the area. The Police Service and relevant supply authority must be called immediately. Damage to any other services must be treated in a similar manner except machinery may remain operational and access may be maintained where it is safe to do so.

All site personnel must be briefed on evacuation and control procedures.

8.5 Failure of Services

8.5.1 Failure of Traffic Signals

In the event that traffic signal infrastructure near the worksite is damaged or fails to operate correctly, all work must cease immediately and Main Roads WA Road Network Operation Centre (RNOC) must be notified immediately (phone 138 111).

8.5.2 Failure of Street Lighting

In the event that street lighting is damaged and fails to operate or operates incorrectly, Traffic Controllers (and other personnel if necessary with appropriate temporary lighting) must be deployed immediately if the lighting failure adversely affects road user safety to control traffic movements as required. Western Power must be notified immediately.

8.5.3 Failure of Power

In the event that power infrastructure is damaged and poses a risk through live current, Traffic Controllers (and other personnel if necessary) must be deployed immediately to secure the site

and prevent entry to the area affected by live power. Western Power must be notified immediately (phone 13 13 51).

8.6 Emergency Contacts

In the event of an emergency the following relevant authorities must be contacted and advised of the nature of works, location, type of emergency and contact details for the site supervisor.

Emergency Service	E-mail/Website	Phone (Emergency)
WA Police Service	State.Traffic.Intelligence.Planning.&.Co-ordination.Unit@police.wa.gov.au	000
St. John Ambulance	Operations_soc@stjohnwa.com.au	000
DFES	operations.command@dfes.wa.gov.au	000
Power	http://www.westernpower.com.au/customerservice/contactus/	13 13 51
Gas	enquiries@atcogas.com.au	13 13 52
Main Roads	enquires@mainroads.wa.gov.au	138 138
MRWA RNOC	RNOC.Control.Room.Information.Desk@mainroads.wa.gov.au	9323 4848

9. MONITORING AND MEASUREMENT

9.1 Daily Inspections

Prior to works commencing the Site Supervisor must communicate the Traffic Management Plan to all key stakeholders and affected parties.

On completion of setting out the traffic control measures, the site is to be monitored for a suitable period of time. If traffic speeds on the approaches to the work site are assessed as being above the temporary posted speed zone for the work site, the Site Supervisor is to initiate action to modify the approach signage and tapers in accordance with the requirements of AGTTM/CoP. All such actions are to be recorded in the Daily Diary. Should road users be observed to continue to travel in excess of the posted speed limit, the police may be requested to attend the site to enforce the temporary posted speed limit.

The Advanced Worksite Traffic Management accredited supervisory person at the worksite may conditionally approve changes made to a complex traffic management plan subject to review and endorsement of the change by an RTM as soon as practicably possible.

The Traffic Management Contractor must ensure that all temporary signs, devices and controls are maintained at all times. To achieve this, procedures in line with the requirements outlined in AGTTM Part 6 will be instituted. The monitoring program must incorporate inspections:

- Before the start of work activities on site,
- During the hours of work,
- Closing down at the end of the shift period, and
- After hours.

A daily record of the inspections must be kept indicating

- When traffic controls where erected,
- When changes to controls occurred and why the changes were undertaken,
- Any significant incidents or observations associated with the traffic controls and their impacts on road users or adjacent properties.

The Traffic Management Contractor must ensure that personnel are assigned to monitor the traffic control scheme. Inspections must at least satisfy the following requirements.

9.1.1 Before works start

- Confirm TMP and TGS are suitable for the day's activities;
- Inspect all signs and devices to ensure they are undamaged, clean and comply with the requirements depicted on the TGS;
- All lamps should be checked and cleaned as necessary;
- After any adjustments have been made to the signs and devices, conduct a drive through inspection to confirm effectiveness.

9.1.2 During work hours

- Designate and ensure that appropriate work personnel drive through the site periodically to inspect all signs and devices and ensure they are undamaged and comply with the requirements depicted on the Traffic Guidance Schemes;.
- Attend to minor problems as they occur;
- Conduct on the spot maintenance/repairs as required;
- When traffic controllers are on the job, ensure they remain in place at all times. Relieve controllers as necessary to ensure attentiveness is retained;

- During breaks or changes in work activities remove or cover any signs that do not apply (e.g. PREPARE TO STOP, Workers symbolic);
- Re-position signs and devices as required by work processes throughout the day and keep records of any changes.

9.1.3 Closing down each day

- Conduct a pre-close down inspection, allowing time for any appropriate maintenance works;
- Remove any unnecessary signage (e.g. Prepare to Stop, Symbolic Workers);
- Replace any unnecessary signage with appropriate delineation;
- Install barriers and lights where required;
- Drive through site and confirm all signs and devices are operating correctly with no misleading visual cues;
- Record details of inspection and any changes made to layout.

9.1.4 After hours

Not Applicable

9.2 TMP Audits and Inspections

One compliance audit (using the 'Compliance Audit Checklist for Traffic Management for Works on Roads' – found on the MRWA website) must be conducted following setting up of the traffic management and prior to commencement of the works.

Audit findings, recommendations and actions taken must be documented and copies forwarded to the Project Manager and the Road Authority's Representative

9.3 Records

A daily diary recording all inspections including variations to the approved TMP must be kept using the Daily Diary.

The Traffic Supervisor is to record all inspections made on a daily basis and at those times prescribed by the Traffic Management Implementation Standards. Upon completion of each day the Traffic Supervisor must provide copies of the daily diary record to the Project Manager.

The Traffic Supervisor is to record all variations made to the approved Traffic Management Plan on a daily basis and indicate clearly the nature of the variations and the reason for the

variations. Upon completion of each day the Traffic Supervisor must provide copies of the variation record to the Project Manager.

9.4 Public Feedback

All public feedback shall be reported to the Project Community and Stakeholder Manager. Traffic controllers and onsite personnel are not to engage in conversation with the public other than for the purposes of public safety whilst directing around the work site.

10. MANAGEMENT REVIEW AND APPROVALS

10.1 TMP Review and Improvement

A review of the effectiveness of the TMP will be undertaken by the Project Manager and Traffic Management Contractor as part of the close-out procedure

10.2 Variations

Where the TMP needs amending, e.g. due to a change in the scope of works or safety concerns, a modified TMP will be submitted for approval to the Road Authority.

Minor on-site adjustments or modifications, if required, must generally only be made following approval and recorded in the daily diary. In emergency situations, on-site adjustments or modifications must be made and recorded in the daily diary, and the Project Manager notified as soon as practicable.

10.3 Approvals, Authorisations and Permits

Before works commence it is necessary to seek approval from the following:

- Main Roads WA (Road Planned Interventions, HVS, etc);
- Shire of Serpentine – Jarrahdale.

APPENDIX A – NOTIFICATION OF ROADWORKS

Note: When required, a Notification of Roadworks form shall be issued by the Project Traffic Manager.

APPENDIX B – VARIATION TO STANDARDS

APPLICATION FOR APPROVAL TO VARY REQUIREMENTS OF AUSTRALIAN STANDARDS AS1742.3 OR MRWA TRAFFIC MANAGEMENT CODES OF PRACTICE

Form Instruction

1. **Section A** – Identify the Principal Agency / person commissioning the activity. (Does not include contractors, subcontractors or **traffic** management company/traffic planners etc).
2. **Section B** – Identify activity location, start / finish date and time, type of traffic management, description location of activity.
3. **Section C** – Identify the person that has prepared the Traffic Management Plan, this person shall have AWTM accreditation.
4. **Section D** – For Works undertaken on a State road or on behalf of Main Roads Western Australia the details of the risk assessment process identified in this application form must be documented and endorsed[1] by an accredited Roadworks Traffic Manager.

   All applications to be addressed to the applicable Main Roads Regional office. For contact information please refer to the online Application kits and guidelines to undertake works. (www.mainroads.wa.gov.au >Our Roads > Conducting Works on Roads).

   For all other applications the details of the risk assessment process identified in this application form must be documented and endorsed[1] by the person responsible for approving the traffic management plan.

   Contact with the appropriate road authority should be made prior to lodgement of this application to determine its suitability and for any additional requirements.
5. **Section E** - Risk implication, identification and assessment process must be undertaken in accordance with Risk Management – Principles and Guidelines AS/NZS ISO 31000. The likelihood and consequences should be rated after the application of any additional counter measures taken utilising Tables from Annexure's 202B and 203B, Main Roads WA - Specification 202 and 203 respectively.

   Incomplete or applications not signed by the RTM[1] will not be processed.

	Applicant (Principal for the Works)	Tonkin Extension Alliance
	Postal address	68 Hassler Road

[1] A person with AWTM accreditation is permitted to endorse a variation of less than 135 % of the allowable lane capacity as outlined in table 4.10 of AS 1742.3. See section 5.6 of the Code of Practice

SITE OFFICE COMPUND - TRAFFIC MANAGEMENT PLAN

Tonkin Extension Alliance

A	Suburb	Osbourne Park	State	WA	Postcode	6017
	Project Manager	Peter Hopfmueller			Telephone	0427 003 602
	Email	Peter.hopfmueller@tonkinalliance.com.au			Facsimile	

B	Anticipated start date				Anticipated finish date	
	Daily work Fro		To		Weekend work	Yes ☒ Sat ☐ No ☐
	Location of works (Road/Street Suburb),					
	Road type (eg undivided, two					
	Description of works					
	Are alterations to permanent traffic signals	Yes ☒	No ☐	N/A ☐		
	Posted Speed	Varies	Worksite speed	Varies	After hours speed	Existing

C	TMP Designer	Strada Consultants				
	Accreditation Number					
	Postal address					
	Suburb		State		Postcode	
	Email		Telephone		Facsimile	
	Endorsement signature					

D	RTM Endorsing Variation[1]	
	Accreditation Number	
	Postal address	

SITE OFFICE COMPUND - TRAFFIC MANAGEMENT PLAN

	Suburb		State		Postcode	
	Email		Telephone		Facsimile	
	Endorsement signature[1]					

For Internal Use Only							
Approving Road Authority							
Approving Officer Position							
Application	Yes ☐ No	If Not Why					
Additional Conditions							
Approved By:		Title		Date		File	

EARLY WORKS - TRAFFIC MANAGEMENT PLAN

E	Description of Variation Requested	Specify Point of Departure from Standard / Code of Practice (List section and page number)	Justification (Why is this necessary)	Additional Counter Measures To Be Taken (Identify additional counter measures to be used to negate the lesser treatment)	Residual Risk[2]		
					L	C	RR

[2] Note: the risk assessment in the TMP also needs to record the variation and include the risk event, pre-treatment risk, treatment and residual risk.

APPENDIX C – RECORD FORMS

EARLY WORKS - TRAFFIC MANAGEMENT PLAN

Tonkin Extension Alliance

Daily Diary
Daily Traffic Management Diary

Location: ____________ **Client:** ____________ **Date:** ____________

TMP No: ____________ **TGS No:** ____________ **Weather Conditions:** ____________ **Diary Sheet:** of ______

Start Time at Depot: ______ **Time Arrive Onsite:** ______ **Commencement of Site Setup:** ______ **Site Setup and Operational:** ______

Site Pulled Down at: ______ **Time Aftercare signs setup:** ______ **TGS No:** ______ **Time left site:** ______ **Finish time at Depot:** ______

☐ **Day Works** ☐ **Night Works** ☐ **Emergency Response** **Site Setup as per TGS ☐ Yes ☐ No (if not comment on next page)**

☐ **Attendance at Pre-Start Meeting** **Did an incident occur (if yes complete incident report form) ☐ Yes ☐ No**

I confirm that the above times of 'setup' and 'pulldown' of traffic management signs and devices are a true and correct

Name (Site Supervisor): ____________ Signed: ____________

Drive Through Checks (Checks must be conducted at least every 2 hours)

Time of check entered. Rule off and leave blank if the check does not apply to the site. Make a note of any issues on the next page.

Traffic Management Site Checks	1	2	3	4	5	6	7	8	9	10
Time										
Are signs upright, clean, visible, level & stable										
Are taper lengths correct										
Are speed limit signs correct and doubled up										
Are sign spacings correct										
Are cone/bollard alignments straight & spaced correctly										
Are devices operating correctly										
Have pedestrians been catered for										

EARLY WORKS - TRAFFIC MANAGEMENT PLAN

Are lane widths adequate										
Are vehicle queue lengths acceptable										
Is road surface condition adequate										

No. of Traffic Management Vehicles Onsite: _____

No. of Traffic Management Personnel Onsite: _____

Traffic Management Personnel Names & Accreditations:

		Accreditation Details	**Time of Break from Stop/Slow** (Traffic controllers must have a 15 minute break every two hours of constant stop/slow operation)							
Position	**Name**		On	Off	On	Off	On	Off	On	Off
Crew Leader:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:

Additional Comments _____

I confirm that the details contained herein are true and correct

Name: (Traffic Management Crew Leader): ______________________ Signed: ______________________

APPENDIX D – TRAFFIC ANALYSIS AND VOLUME COUNTS

mainroads WESTERN AUSTRALIA

SITE 51194

Hourly Volume

Kargotich Rd (1080009)

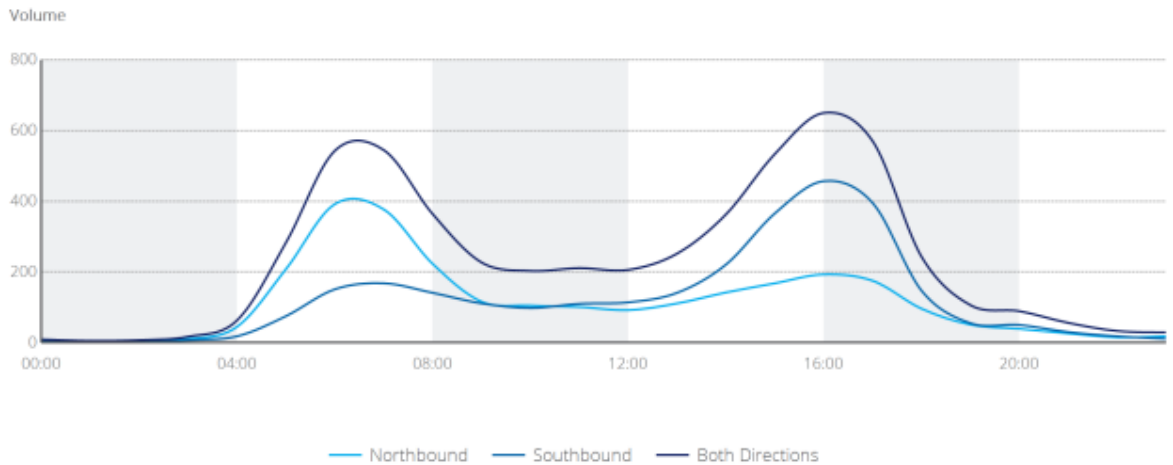
South of Orton Rd (SLK 7.30)

2023/24
Monday to Friday

	All Vehicles			Heavy Vehicles			
	NB	SB	Both	NB	SB	Both	%
00:00	3	6	9	0	1	1	11.1
01:00	3	2	5	0	0	0	0.0
02:00	6	1	7	2	0	2	28.6
03:00	10	7	17	4	4	8	47.1
04:00	45	18	63	12	6	18	28.6
05:00	208	75	283	67	18	85	30.0
06:00	392	151	543	104	36	140	25.8
07:00	377	168	545	87	43	130	23.9
08:00	223	141	364	57	37	94	25.8
09:00	116	111	227	39	33	72	31.7
10:00	105	98	203	33	35	68	33.5
11:00	101	110	211	36	39	75	35.5
12:00	92	114	206	36	43	79	38.3
13:00	111	141	252	40	47	87	34.5
14:00	142	221	363	37	61	98	27.0
15:00	168	366	534	49	94	143	26.8
16:00	193	457	650	52	107	159	24.5
17:00	175	395	570	36	75	111	19.5
18:00	96	147	243	19	32	51	21.0
19:00	51	55	106	12	12	24	22.6
20:00	39	50	89	11	9	20	22.5
21:00	26	30	56	5	4	9	16.1
22:00	15	18	33	2	4	6	18.2
23:00	18	11	29	2	1	3	10.3
TOTAL	2715	2893	5608	742	741	1483	26.4

Peak Statistics

AM	TIME	06:00	07:15	07:00	05:45	06:30	06:15
	VOL	392	173	545	110	44	148
PM	TIME	15:45	16:15	16:15	16:00	16:00	16:00
	VOL	200	471	665	52	107	159



APPENDIX E – ROADWAY ACCESS AUTHORISATION PERMIT

APPENDIX F – TRAFFIC GUIDANCE SCHEMES

Rev.	DATE	DESCRIPTION	APPROVED
0	12.05.25	ISSUED FOR STAKEHOLDER REVIEW	TG

METADATA

GROUND SURVEY STANDARD:

DATE OF CAPTURE:

MAPPING SURVEY STANDARD:

DATE OF CAPTURE:

MAIN ROADS PROJECT ZONE:

HEIGHT DATUM:

Tonkin Extension Alliance

strada road project consultants

DESIGNED	D.TAYLOR STAP-AWTM-23-11544-06	12.05.25	
DRAWN	D. TAYLOR STAP-AWTM-23-11544-06	12.05.25	
REVISED			
REVIEWED &ENDORSED	T.GREEN RTM037	12.05.25	

DRAWING TITLE

TONKIN EXTENSION ALLIANCE
SITE OFFICE COMPOUND LAYOUT
LONG-TERM AFTERCARE ARRANGMENT
TRAFFIC MANAGEMENT LAYOUT

SHEET: A1

SHEET No.: SHEET 1 OF 2

LOCAL AUTHORITY: SHIRE OF SERPENTINE/JARRAHDALE

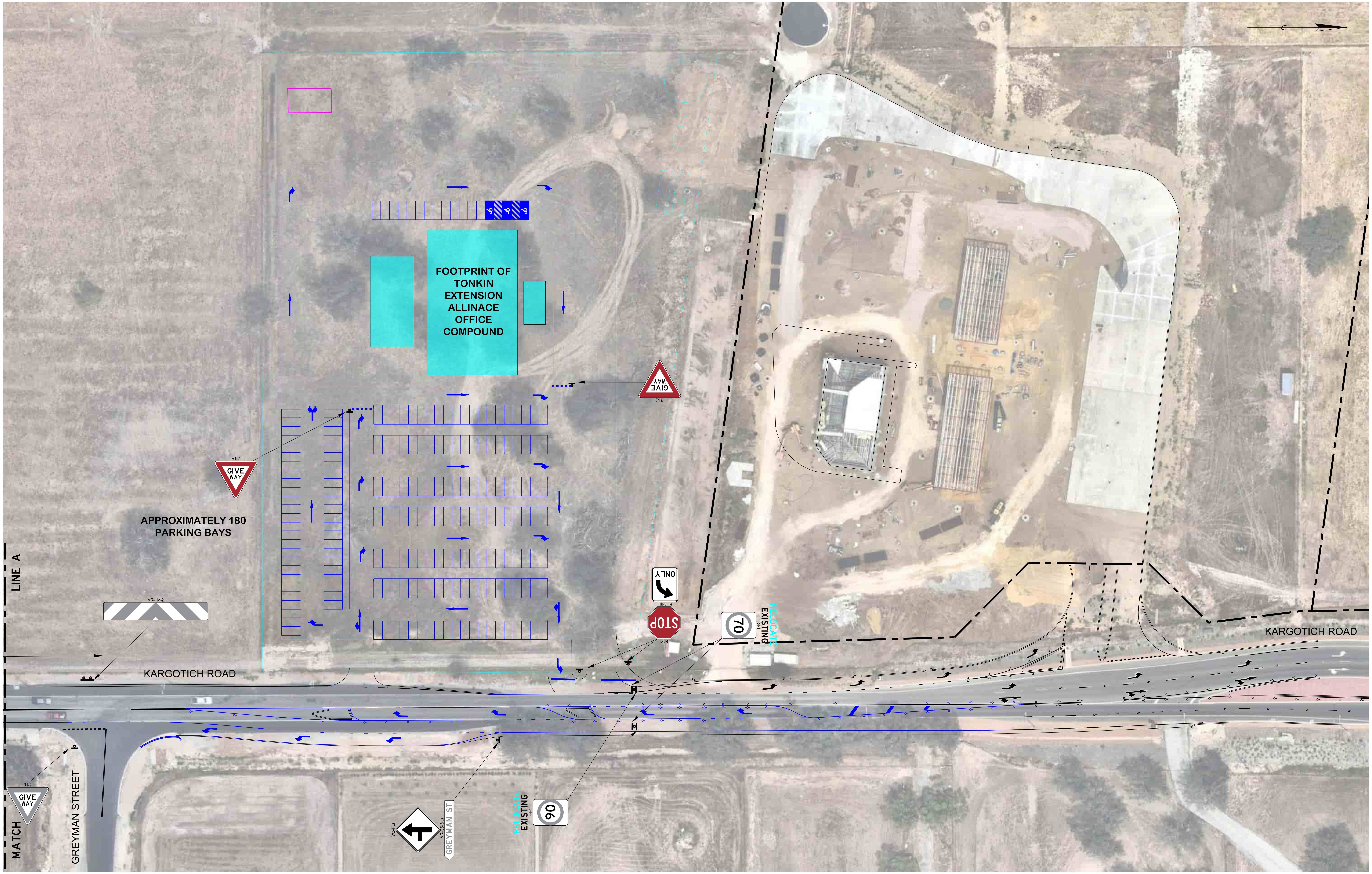
MAIN ROADS RESPONSIBILITY AREA: -

DRAWING STATUS: -

DRAWING NUMBER: TEA-00-TF-0110-DWG-3000

REV: 0

SCALE: 1:500@A1



1:500@A1

SCALE

Rev.	DATE	DESCRIPTION	APPROVED
1	12.05.25	REVISED ALIGNMENT FOR GREYMAN STREET INTERSECTION AND INTERIM SERVICE STATION CROSSOVER	TG
0	04.04.25	ISSUED FOR STAKEHOLDER REVIEW	TG

METADATA
GROUND SURVEY STANDARD:
DATE OF CAPTURE:
MAPPING SURVEY STANDARD:
DATE OF CAPTURE:
MAIN ROADS PROJECT ZONE:
HEIGHT DATUM:

Tonkin Extension Alliance

strada road project consultants

DESIGNED	D.TAYLOR STAP-AWTM-23-11544-06	04.04.25	
DRAWN	D. TAYLOR STAP-AWTM-23-11544-06	04.04.25	
REVISED	D.TAYLOR STAP-AWTM-23-11544-06	12.05.25	
REVIEWED &ENDORSED	T.GREEN RTM037	12.05.25	

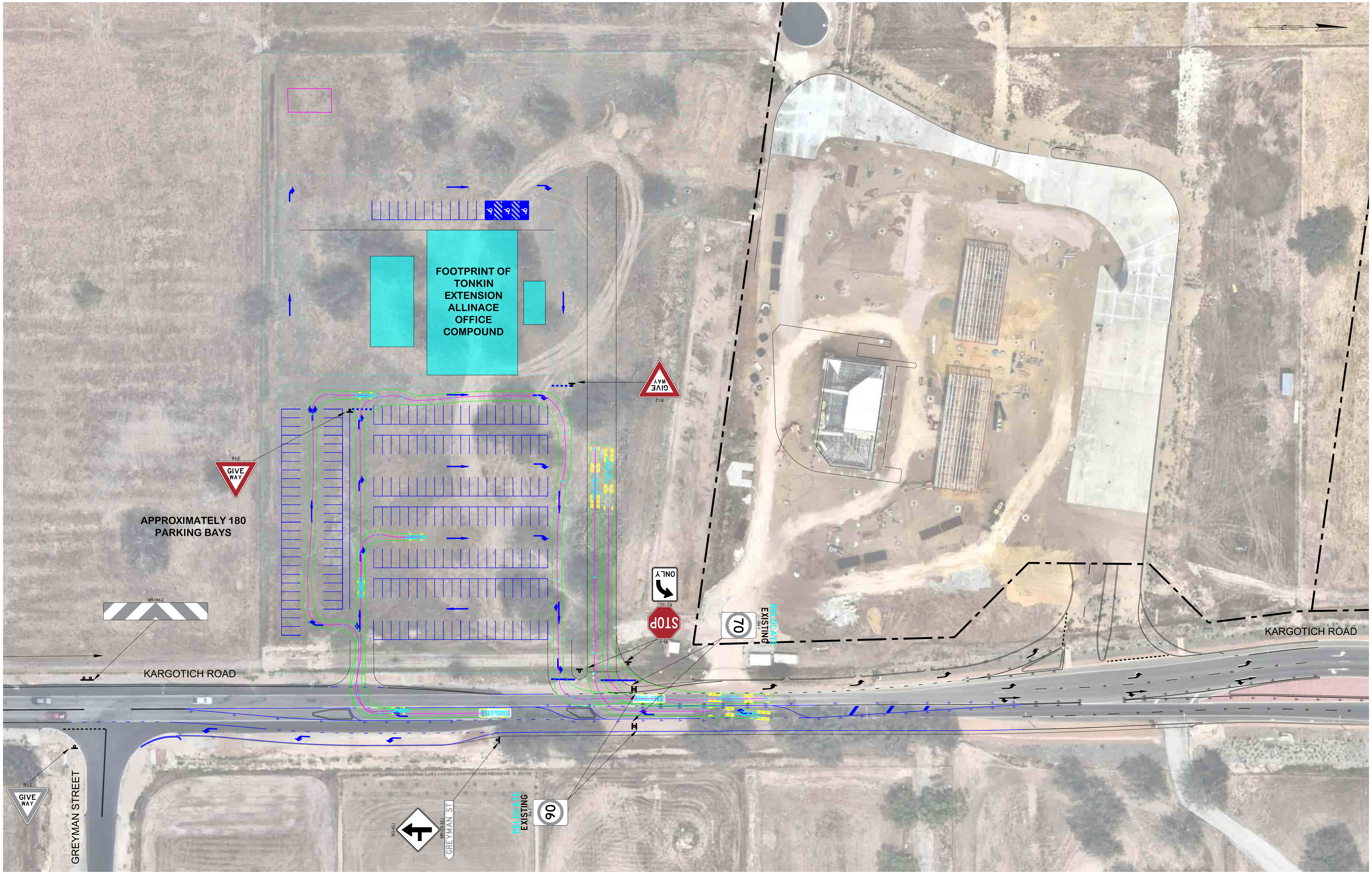
DRAWING TITLE
TONKIN EXTENSION ALLIANCE
SITE OFFICE COMPOUND LAYOUT
LONG-TERM AFTERCARE ARRANGMENT
TRAFFIC MANAGEMENT LAYOUT

SHEET A1

SHEET No. SHEET 2 OF 2

LOCAL AUTHORITY: SHIRE OF SERPENTINE/JARRAHDALE
MAIN ROADS RESPONSIBILITY AREA: -

DRAWING STATUS: -
DRAWING NUMBER: TEA-00-TF-0110-DWG-3001
REV: 1



1:500@A1

SCALE

Rev.	DATE	DESCRIPTION	APPROVED
1	12.05.25	REVISED ALIGNMENT FOR GREYMAN STREET INTERSECTION AND INTERIM SERVICE STATION CROSSOVER	TG
0	04.04.25	ISSUED FOR STAKEHOLDER REVIEW	TG

METADATA

GROUND SURVEY STANDARD:

DATE OF CAPTURE:

MAPPING SURVEY STANDARD:

DATE OF CAPTURE:

MAIN ROADS PROJECT ZONE:

HEIGHT DATUM:

Tonkin Extension Alliance

strada road project consultants

DESIGNED	D. TAYLOR STAP-AWTM-23-11544-06	04.04.25	
DRAWN	D. TAYLOR STAP-AWTM-23-11544-06	04.04.25	
REVISED	D. TAYLOR STAP-AWTM-23-11544-06	12.05.25	
REVIEWED & ENDORSED	T.GREEN RTM037	12.05.25	

DRAWING TITLE
TONKIN EXTENSION ALLIANCE
SITE OFFICE COMPOUND LAYOUT
LONG-TERM AFTERCARE ARRANGMENT
SWEPT PATH DETAIL

SHEET A1

SHEET No. SHEET 1 OF 1

LOCAL AUTHORITY: SHIRE OF SERPENTINE/JARRAHDALE

MAIN ROADS RESPONSIBILITY AREA:

DRAWING STATUS:

DRAWING NUMBER: TEA-00-TF-0110-DWG-3002

REV 1

Tonkin Extension Alliance

ENVIRONMENTAL MANAGEMENT PLAN – TEMPORARY SITE OFFICE 1780 THOMAS ROAD (CORNER KARGOTICH ROAD) OAKFORD

TONKIN HIGHWAY EXTENSION AND THOMAS ROAD UPGRADE PROJECT

Contract Number:	258/22
Document Number:	TEA-01-EN-0000-PLN-0001
Revision Date:	02/04/2025
Revision:	0

DETAILS OF REVISION AMENDMENTS

Document Control

The Alliance Director is responsible for ensuring that this plan is reviewed and approved. The Commercial Manager is responsible for updating this plan to reflect changes to the project, legal and other requirements, as and when required.

Amendments

Any revisions or amendments must be approved by the Alliance Board and certified by the Independent Certifier before being distributed / implemented.

Version	Date	Version Details	Compiled By	Corporate HSE Representative	PM Line Manager
0	02/04/2025	EMP formulated	Yossi Taylor / M.Rhodes	Nick Kemp	Kevin Garry

TABLE OF CONTENTS

1. Introduction and Purpose

The purpose of this Environmental Management Plan (EMP) is to describe how environmental aspects are to be managed so that the site and those engaged onsite will:

- Comply with TEA Policy, Client, legal and other obligations;
- Minimise the impacts on the environment;
- Achieve the Company, client and site objectives and targets.

This Management Plan is written in accordance with TEA's health, safety and environment management system that is third party certified to AS/NZS ISO 14001. The development of this Management Plan has been based upon the risks and opportunities identified, and specifically address client, contractual, legal and other obligations. The focus of this EMP is the temporary site office located on Kargotich Road, Oakford.

1.1. Amendments and Authorisation

This Management Plan will be approved by the Section Manager, their Line Manager and a Representative from the HSE Department. This Management Plan and other related documents will be reviewed annually or as a result of:

- Changes to Company procedures or processes;
- Changes to key personnel or resources;
- Changes in legal and other obligations
- Findings from an audit or inspection;
- Findings from a significant incident or near miss;
- Significant changes to site conditions and/or work methods
- Instructions from the Main Roads WA.

Reviews will be undertaken in consultation with key stakeholders to ensure all locations/functions are considered. A record of the date and comments relating to any revisions of this document will be included in the revision table.

The only Tonkin Extension Alliance (TEA) authorisation required to amend this document after initial approval is the Section Manager's.

1.2. Communication of this Plan

The Section Manager is accountable for ensuring:

- Location and access to the management plans is communicated at induction
- Management Plans have been communicated to subcontractor personnel prior to commencement of works onsite
- Any changes made to the management plan are communicated to affected persons on the site

1.3. Supporting Management Plans

The following management plans have been developed to support this management plan:

- Emergency Response and Preparedness Plan
- TEA Crisis Management Plan (controlled by TEA's Perth Head Office and available on Company Intranet).

1.4. Terminology & Definitions

Terms and definitions used within this document are further explained in TEA's *Terminology & Definitions Procedure*.

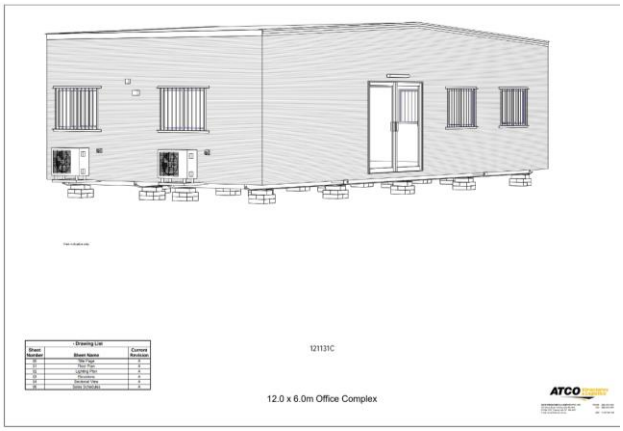
2. Scope of Works

The Tonkin Extension Alliance (TEA) is a partnership between TEA Group, BMD, Civcon, GHD and BG&E together with Main Roads. The Tonkin Highway Extension and Thomas Road Upgrade Project will extend Tonkin Highway from its current termination at Thomas Road to South Western Highway, and duplicate Thomas Road from Kargotich Road to Alexander Road.

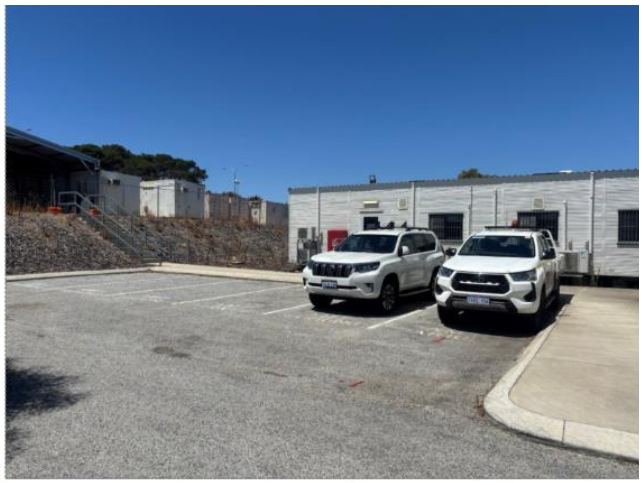
The scope involves approximately 14 km of four lane dual carriageway and will include interchanges at Thomas Road and Bishop Road, intersections at Orton Road, Mundijong Road and South Western Highway, as well as a bridge over the freight/passenger railway line adjacent to Bishop Road and at Wright Road. The project includes 5 km of duplication upgrades to Thomas Road extending from Kargotich Road to Alexander Road. A separate CEMP will be prepared for the main alignment works.

This Temporary Site Office Construction Environmental Management Plan has been prepared for the establishment of a temporary site office to accommodate staff and contractors (approximately 120) and a car parking for up to 200, allowing for a May commencement for earthworks.

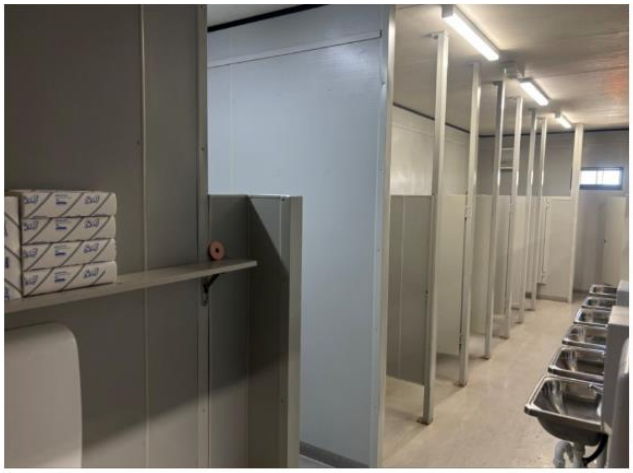
- Clear existing trees and remove vegetation and topsoil
- Build fill layer up 0.5m across entire site
- Import two site offices as per Figures 1 and 2
- Build carpark area and establish earth bund around the site to prevent water movement off site
- Connect power and water services
- Install septic system (subject to Department of Health approval and Serpentine-Jarradale Environmental Health Officer)
- Install drainage to direct water eastward to tie into existing swale drain.



Exterior Reception and Office



Exterior



Restroom

Training room exterior

Figures 1-2: Site Office Configuration and Images

2.1. Landform and Climatic Conditions

The Project footprint traverses the Shire of Serpentine-Jarrahdale Local Government Area (LGA) on the Swan Coastal Plain in Western Australia. The Swan Coastal Plain lies in the south-west portion of the southern Bassian zoogeographic region (Serventy & Whittell, 1976) and in the Darling Botanical District of the mesic South-West Botanical Province (Beard, 1981). The Swan Coastal Plain consists of several geomorphological elements, these are from west to east the Quindalup Dunes, Spearwood Dunes and Bassendean Dunes, occurring in bands roughly parallel to the coast. Further inland and approaching the base of the Darling Scarp these sediments merge into the Pinjarra Plain, with the Ridge Hill Shelf at the edge of the hills. The Project area traverses areas of the Pinjarra Plain geomorphological unit. This landform is primarily of alluvial origin, with primarily clay soils with sand (GoWA, 2000).

Vegetation within the Kargotich Road Site Office area is described as isolated *Casuarina obesa* (Swamp Sheoak) trees over grassland. A picture taken from google earth shows there are 14 trees which within the project area. On the 24th March 2025, an environmental assessment of the project area was undertaken with a site inspection undertaken to confirm tree species which were found to be Swamp Sheoak trees. These were also checked for nests / hollows with no evidence found on the day of the assessment. Samples of vegetation were also taken for positive identification by a botanist (Brian Morgan 2025).

Figure 3: Aerial View of Site

The Project area is located within both the Swan-Canning Catchment (Lower Canning and Southern River sub-catchments) and the upper Peel-Harvey Catchment.

No surface water in the forms of creeks or wetlands are located in the project footprint.

2.2. Map of the Site Area

A map of the proposed project footprint including offices / car park layout is provided below:

Figure 4: Location of Site Office on 1780 Thomas Road (corner of Kargotich Road)

3. Policy, Objectives and Targets

The following documents provide further information in regard to this topic:

- *Management System Standard*

3.1. Policy

This Management Plan has been prepared in accordance with TEA's Environmental Policy. All relevant works, including those conducted by subcontractors or by other companies on TEA's behalf, will conform to this Policy.

ALLIANCE POLICY

TONKIN EXTENSION ALLIANCE
ABN: 64 335 081 198

No. 03 - ENVIRONMENTAL

Tonkin Extension Alliance is committed to minimising, where reasonably practicable, its impact on the natural environment and social surroundings for the benefit of current and future generations through continual improvement of the Environmental Management System and subsequent enhanced environmental performance.

To achieve this commitment, Tonkin Extension Alliance will:

- Set environmental objectives and targets applicable to the aspects and potential impacts of projects and facilities.
- Establish positive relationships with community, sub-contractors and suppliers.
- Comply with all applicable environmental laws, regulations, statutory obligations and client environmental requirements.
- Identify significant environmental aspects and implement effective pollution prevention and control measures.
- Provide measures to protect heritage, biodiversity, land and waterways.
- Manage potential community impacts related to air quality, noise and vibration.
- Practice responsible resource use and waste management including the promotion of efficient use, reuse and recycling of resources.
- Ensure the continued effectiveness and improvement of Tonkin Extension Alliance's management system and practices to meet its business needs, AS/NZS ISO 14001, client and other obligations.
- Hold employees and subcontractors accountable for proactively meeting their environmental responsibilities.

Achieving these commitments is fundamental to demonstrate a positive impact on the environment and communities associated with Tonkin Extension Alliance's activities and developments.

Peter Hopfmueller
Alliance Director
Tonkin Extension Alliance
March 2025

Care
Integrity
Collaboration
Excellence

TEA-00-HC-0000-POL-0003
Rev.0 (21/03/2025)
Page 1 of 1

TEA Environmental Policy will be communicated to all workers at their site induction and displayed at the site. TEA's policies will be made available to any interested party.

FEBRUARY 2023

mainroads WESTERN AUSTRALIA

Environmental Policy

We are committed to protecting and enhancing the environmental, including heritage, and social values in all of our activities, products and services.

Intent

All Main Roads staff and others working on Main Roads behalf will:

- Recognise the importance of the environmental and social values and the broader benefits that these values provide to the community.
- Foster strategic relationships with community and other stakeholders to contribute to the management of environmental values.
- Facilitate environmental governance of our activities to deliver broad community benefit through the inclusion of environmental requirements in planning, programming, construction and maintenance practices.
- Communicate this policy and our environmental performance publicly.

Objectives

To ensure we achieve this policy our objectives are to:

- Deliver our services in full compliance with environmental legislation, regulation and policy, and with agreed environmental commitments as a minimum standard.
- Manage the environmental impacts of our activities through the hierarchy of 'avoid, minimise, rehabilitate and offset'.
- Contribute to a sustainable transport system through the delivery of products and services that minimise environmental impacts, conserve natural resources, minimise the creation and emission of wastes and achieves positive social and economic outcomes.
- Implement, maintain and continually improve an effective environmental management system compliant with ISO14001:2015 across Main Roads activities to enhance our environmental performance.

John Erceg
Managing Director of Main Roads

This policy forms part of the Integrated Management System (IMS) and is reviewed every two years or as required to ensure it complies and is relevant to legislative and business obligations.

www.mainroads.wa.gov.au

We're working for Western Australia.

3.2. Objectives & Targets

The following objectives and targets have been set for the site taking into account the significant hazards and environmental aspects of the job, the group objectives and client and contractual

requirements. Performance against all Environmental objectives will be monitored, as a minimum, quarterly at site meetings.

#	Environmental Objective	Frequency/Target	Basis of Measurement
1	Undertake annual Environmental Audits of the CEMP	Annual	Project Audit Schedule Environmental Audit Reports HSEQ-Project Dashboard (Tableau) Beakon – Actions (i.e. OFIs, NCRs)
2	Environmental minimum inspection targets to be assigned to team members in HSE Critical positions Note: Project Critical roles may include • Management Team Members • Engineers • Site Management/Superintendents • Supervisory Personnel • HSE Personnel	Environmental DHI 4 per month	▪ 90% of assigned targets completed ▪ Individual performance against assigned inspection targets to be communicated and reviewed at Project HSEQ Performance Review Minutes ▪ HSEQ-Project Dashboard (Tableau) ▪ Beakon – Forms Module ▪ Project KPI schedule
3	Environmental Management Plans implemented and reviewed	Complete start up in the first 6 months and then Annually	▪ Environmental Management Plan/s – revision table. ▪ Reviewed at least annually or where instructed.
4	Waste Monitoring	Monthly	▪ Collection of waste reports/records ▪ Circular economy principles implemented
5	Toolbox Meetings	Monthly	▪ 1 Toolbox minimum per month & recorded on Beakon Toolbox Form. ▪ HSE & Q topics to be agreed in monthly HSEQ meetings ▪ HSEQ-Project Dashboard (Tableau)

The following documents provide further information in regard to this topic:

- *Management System Standard*
- *HSE Legal and Other Obligations Directory*

3.3. General

The following environmental legislation applies directly to project works. Legislation specific to certain environmental elements are included in the Relevant Sub-Plans:

Commonwealth Government

- *Aboriginal and Torres Strait Island Heritage Protection Act 1984*
- *Aboriginal and Torres Strait Island Heritage Protection Regulations 1984*
- *Biosecurity Act 2015*

- *Biosecurity Regulations 2016*
- *Environmental Protection and Biodiversity Conservation Act 1999*
- *Environmental Protection and Biodiversity Conservation Regulations 2000*
- *National Environmental Protection Council Act 1994*
- *National Greenhouse and Energy Reporting Act 2007*
- *National Greenhouse and Energy Reporting Regulations 2008*

Western Australia (WA)

- *Aboriginal Heritage Act 1972*
- *Aboriginal Heritage Regulations 1974*
- *Biodiversity Conservation Act 2016*
- *Biosecurity and Agriculture Management Act 2007*
- *Biosecurity and Agriculture Management Regulations 2013*
- *Biodiversity Conservation Regulations 2018*
- *Conservation and Land Management Act 1984*
- *Conservation and Land Management Regulations 2002*
- *Contaminated Sites Act 2003*
- *Contaminated Sites Regulations 2006*
- *Dangerous Goods Safety Act 2004*
- *Dangerous Goods Safety (General) Regulations 2007*
- *Environmental Protection Act 1986*
- *Environmental Protection Regulations 1987*
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*
- *Environmental Protection (Controlled Waste) Regulations 2004*
- *Environmental Protection (Unauthorised Discharges) Regulations 2004*
- *Heritage of Western Australia Act 1990*
- *Heritage Regulations 2019*
- *Litter Act 1979*
- *Litter Regulation 1981*
- *Rights in Water and Irrigation Act 1914*
- *Planning and Development Act 2005*
- *Planning and Development Regulations 2009*

- *Waste Avoidance and Resource Recovery Act 2007*
- *Waste Avoidance and Resource Recovery Regulations 2008*
- *Waterways Conservation Act 1976*
- *Waterways Conservation Regulations 1981*
- *Wildlife Conservation Act 1950*

3.4. Local Government/Municipality

Local government / municipality environmental requirements relevant to the site are as follows:

Description of Local Requirement	How does the requirement apply?	How will TEA comply with the requirement?
Shire of Serpentine Jarrahdale – Acoustic considerations	Guidance for the Assessment of Environmental Factors, Separation Distances between industrial and sensitive land uses (WAPC 2005) Other noise generating developments within close proximity to sensitive receptors (dwellings), including construction phase.	The site is bound by Kargotich Road and a petrol station. Being an office noise generating activities are not envisaged. In this instance we do not consider that an acoustic report is required to support the development proposal as the site will not be accessed by heavy equipment (light vehicles only).
Shire of Serpentine Jarrahdale – Work hours and after hours noise approval	Application for Approval of Noise and Vibration Management Plan under the Environmental Protection (Noise) Regulations 1997	Appendix 9 provides the Noise and Vibration Management Plan. Construction work in residential areas will only be conducted between the hours of 7 am and 7 pm on days other than Sundays and public holidays. Work outside of these hours will require an afterhours approval from the Shire of Serpentine Jarrahdale.
Shire of Serpentine Jarrahdale – Bushfire	The land falls within a designated bushfire prone area triggering the application of State Planning Policy 3.7: Planning in Bushfire Prone Areas and appurtenant Guidelines for Planning in Bushfire Prone Areas.	A Bushfire Prevention and Management Sub Plan has been prepared for the site (refer Appendix 11). The Plan sets out the response to the bushfire protection criteria. The site will require clearing to accommodate the site office and car park ensuring the site is maintained in

		a low-fuel state. The bushfire risk is considered acceptable and manageable, and therefore bushfire risk will not impede development of the site. Relevant responsibilities are set out in Emergency Response Plan.
Shire of Serpentine Jarrahdale – building form and set backs	TPS3 defines the form and setbacks	The works are temporary and setback is to a road, The temporary office will not unduly encroach on residential uses (refer Figures 1-2).
Shire of Serpentine Jarrahdale - Development Approval	Application for a Development Approval (planning and development act) at the proposed site office location at Kargotich Road / Thomas Road.	TEA will submit all supporting information for per the 'Application for Development Approval' with the Shire of Serpentine Jarrahdale. Once approved, all conditions under the Development Approval will be implemented by TEA.
Department of Water and Environmental Protection	Water abstraction Clearing permit (if required)	5C Licence to take water and 26D Licence to construct a well. Groundwater bore construction and abstraction commitments and conditions (commenced by MRWA with 6 bores) - abstraction volumes and annual reporting. Clearing of swamp sheoks.
Shire of Serpentine Jarrahdale - Environmental Health Services Department of Health (DOH), Environmental Health Directorate	Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974 (external site). On-site disposal of wastewater is required in areas where reticulated sewerage is not available. An application must be lodged to construct and install an apparatus for on-site wastewater disposal. The TEA will complete and lodge an Application to Construct or Install an Apparatus for the Treatment of Sewage.	Sewerage treatment approval
Shire of Serpentine Jarrahdale - Building permit requirements	A building permit application will not be required for fill or fill spill related to road infrastructure. As part of a certified building permit application, an Independent building surveyor contractor to issue a BA3 Certificate of Design Compliance,	Building application form BA01 – Application for building permit (certified) by a registered building surveyor.

	certified the proposed design documentation. This generally requires scaled drawings, engineering details, an energy efficiency report and any other documents the certifying building surveyor requests before issuing the BA3.	

3.5. Environmental Licences/Permits/Approvals

The Environmental Lead will be responsible for:

- Confirm Shire of Serpentine Jarrahdale environmental requirements.
- Identifying the environmental licences and or permits under which the site will operate.
- Obtaining a copy of any client held licences/ permits/approvals to determine conditions of compliance or if not available obtaining written verification that licences and permits are held.
- Obtaining TEA held licences and or permits.
- Supply an electronic copy of all environmental licences/permits to the Environmental Representative within five working days of receipt.
- Monitoring compliance to the conditions of the licence/permit and report on the status to MRWA as required.

3.6. Infringement, Improvement and Prohibition Notices

The Section Manager or delegate will ensure any infringement, improvement or prohibition notice issued by a regulatory authority recorded as an incident in TEA's Incident reporting database (*Beakon*), and appropriate actions taken in a timely manner. A copy of the infringement, improvement or prohibition will be added to the incident report and forwarded to the HS/E Business Unit Lead.

The Project Director will notify, via email, their General Manager, Construction Manager, Operations Manager, HS/E Business Unit & Environmental Representative Lead when the infringement, improvement or prohibitions notice has been closed out.

3.7. Availability of Statutory and Other Information

TEAs HSEQ Department maintains links to current statutory documents (Acts, Regulations, and Codes of Practice) in the *HSE Legal and Other Obligations Directory*, which are located on TEA's Intranet (GENIE). TEA subscribes to Environmental Essentials product *Envirolaw* which is available to all personnel through the intranet link. *Envirolaw* summarises environmental legal obligations, provides links to legislation and guidelines as well as providing search capabilities.

Changes in legislation are monitored by the HSEQ Department and site management will be notified where a change affects a site. The Section Manager will be responsible for communicating changes in accordance with section 5. HSE will ensure the change is reflected in this Management Plan and other relevant plans and documents as applicable.

4. Structure and Responsibilities

4.1. HSE Organisational Structure

The site HSE organisational structure has been documented in the ***Site Organisational Chart***. The Site Organisational Chart identifies the roles that will support the site in fulfilling their HSE responsibilities.

4.2. Roles and Responsibilities

The Section Manager is accountable to the Construction Director for the performance of the project and the implementation of the project's management plans. Key personnel will acknowledge their understanding and acceptance of their site responsibilities by signing Appendix 1 in this plan.

Section Manager
The Section Manager is accountable for creating an exemplary HSE culture and execution of the management system on their site and will: • Hold as a minimum, monthly meetings to review Environmental performance and monitor implementation and effectiveness of the management system • Ensure their direct reports fulfil their Environmental responsibilities and achievement of KPI's • Support workers to immediately stop any 'At Risk Behaviour' identified during their work activities
Senior Project Engineer
The Senior Project Engineer is responsible for creating an exemplary HSE culture and ensuring adherence to the management system on their site and will: • Participate in Environmental performance review at site meetings • Review, evaluate and update ***Project Risk Registers***; and incorporate HSE risk controls, procedures and permits into their planning processes of design review and work method statements • Assist in the identification and resolution of Environmental issues arising within their construction area of responsibility • Ensure their direct reports fulfil their Environmental responsibilities and achievement of KPI's • Supporting workers to immediately stop any 'At Risk Behaviour' identified during their work activities
Project Engineer
The Project Engineer/Contracts Administrator is responsible for creating an exemplary HSE culture and ensuring adherence to the management system on their site and will: • Participate in Environmental performance review at site meetings • Review, evaluate and update the ***Project Risk Registers*** and incorporate Environmental risk controls, procedures and permits into their planning processes of design review and work method statements

- Assist in the identification and resolution of Environmental issues arising within their construction area of responsibility
- Close out of actions to address hazards/incidents in a timely manner
- Supporting workers to immediately stop any 'At Risk Behaviour' identified during their work activities

Superintendent
The Superintendent is responsible for creating an exemplary HSE culture and ensuring adherence to the Management System on their site. The Superintendent is responsible for approving the commencement of works and to allocate necessary resources to complete a job safely in accordance with the Management Plan and will: • Demonstrate commitment to the Environment by monitoring the workplace to ensure work practices are adhered to by way of routine checks of the workplace compliance to the Management Plan • Demonstrate through their actions and behaviour that safety and the environment are core values • Hold Supervisors and leading hands (TEA & subcontractors) accountable for the fulfilment of their Environmental responsibilities, including KPI's • Allocate work to ensure appropriate supervision for those with lesser experience • Ensure appropriate and necessary plant and equipment is provided for workers to carry out their work safely and without undue harm to the environment • Stop, reject or quarantine materials, plant and equipment • Support workers to immediately stop any 'At Risk Behaviour' identified during their work activities • Participate in audits, investigations and constructability reviews • Management and HSE performance of the subcontractors utilised on site.
Supervisor
The Supervisor is responsible for creating an exemplary HSE culture and ensuring workers under their supervision work in accordance to the Management System and will: • Demonstrate commitment to the Environment HSE by monitoring the workplace to ensure safe work practices are adhered to by way of routine checks of the workplace compliance to the Management Plan and other GMS requirements • Demonstrate through their actions and behaviour that safety and the environment are core values • Hold workers accountable for the fulfilment of their Environmental responsibilities and working in accordance to their SWMS, permit or safe work instruction • Allocate work to ensure appropriate supervision for those with lesser experience • Ensure appropriate and necessary plant and equipment is provided for workers to carry out their work safely and without undue harm to the environment • Stop, reject or quarantine materials, plant and equipment • Support workers to immediately stop any 'At Risk Behaviour' identified during their work activities • Participate in audits, investigations and constructability reviews • Management of Environmental performance of the subcontractors utilised on site.

Site HSES Manager
The Site HSES Manager is responsible for creating in conjunction with the Section Manager an exemplary HSE culture and ensuring implementation of the HSE management system and will: • Demonstrate through their actions and behaviour that HSE is a core value • Hold accountable their staff for the fulfilment of their Environmental responsibilities, including KPI's • Provide coaching and mentoring for behavioural change • Work closely with Supervisors to assist them in understanding their Environmental responsibilities and the procedures they need to comply with • Monitor Environmental controls on site • Collect and analyse data to review Environmental performance • Assist in the development and review of work method statements and SWMS's • Immediately stop any 'At Risk Behaviour' identified during daily work activities
Environmental Advisor
To create in conjunction with the Section Manager an exemplary HSE culture and implement the company's HSE management system and will: • Demonstrate through their actions and behaviour that the Environment is a core value • Hold accountable their staff for the fulfilment of their Environmental responsibilities, including KPI's • Provide coaching and mentoring for behavioural change • Work closely with Supervisors to assist them in understanding their Environmental responsibilities and the procedures they need to comply with • Monitor Environmental controls on site • Collect and analyse data to review Environmental performance • Assist in the development and review of work method statements and SWMS's • Immediately stop any 'At Risk Behaviour' identified during daily work activities
All Personnel
All personnel on site are responsible for: • Carrying out their work in a manner, which does not put themselves or others at risk of harm • Only performing tasks for which they are competent • Clarify with their supervisor any matter, which may put them or others at risk of harm • Ceasing work when identified as an unsafe act and reporting • Attending prestart meetings • Conducting prestart tasks (Take 5's, plant prestarts) • Attending Environmental presentations and toolbox meetings • Reporting incidents, illness, injuries and hazards • Assisting in achieving the site performance goals • Working proactively with the Client • Ensuring compliance with the requirements of the HSE management system • Participating and adhering to SWI's/Operational Procedures and SWMS's • Adhering to all permit requirements • Removing or isolating any hazard identified during daily work activities • Immediately stopping any 'At Risk Behaviour' identified during daily work activities • Complying with statutory and regulatory requirements

4.3. Communication and Acceptance of Accountabilities and Responsibilities

The Core Site Team will acknowledge their understanding and acceptance of the site accountabilities and responsibilities by signing Appendix 1 in this plan.

4.4. Field Leadership Visits

Senior Management with an operational role or functional support will demonstrate visible and proactive commitment by visiting site to engage in discussion with site management and workers in regard to HSE issues relevant to the business which may include any of the following:

- Active participation and contribution in Prestart meetings;
- Participation in Toolbox Talks;
- Participation in the delivery of site safety messages, on-site safety programs or initiatives;
- Participation in work inspections;
- One-on-one discussions;
- Behavioural observations;
- Participation in meetings discussing HSEQ performance;

A record of the visit and the activity undertaken by the Senior Manager will be recorded and where appropriate feedback provided to the Site team.

5. Communication and Consultation

The following documents provide further information in regard to this topic:

- *HSEQ Communication and Consultation Standard*
- *Community Relationship Management Guideline*
- *Resolution of HSE Issues Procedure*

5.1. Internal Communication and Consultation

Communication and consultative arrangements will be put in place to provide workers, including subcontractors with information and an opportunity to contribute to *TEA Management System (GMS)* and HSE decision making.

Within 2 months of mobilisation or when 40% of the workforce are mobilised, whichever is first, a toolbox will be held with workers to discuss as a group how health, safety and environmental consultation is going to be achieved on the site. A record of the agreed method/s of consultation will be recorded in the *Toolbox Meeting Minute Form*. New workers will be consulted on the agreed method/s of consultation at site induction.

The Site will use the methods detailed below to communicate to employees, subcontractors and visitors' information in regard to the *TEA Management System*, this management plan, performance and environmental issues.

5.1.1. Inductions

Inductions will be completed in accordance with the *Health and Safety Management Plan*.

5.1.2. HSE Notice Boards

All worksites that have a crib room will set up a HSE notice board to display:

- Environmental Bulletins/Alerts;
- Project Organisational Chart;
- A Site Layout Plan & Site Emergency Contacts and Evacuation Plan (These will also be posted in prominent locations throughout the site as described in the site *Emergency Preparedness and Response Management Plan*).

5.1.3. HSE Alerts /Bulletins

Incident Alerts will be used to communicate learning's and actions required to assist in ensuring incidents that have occurred in one workplace are not repeated in others. HSE Bulletins will be used to communicate environmental information to the workplace. HSE Alerts and Bulletins will be developed by the Site Team using the approved templates and approved by the HS/E Business Unit Lead prior to communication.

5.1.4. Site Meetings

The following meetings will be held on site to monitor implementation of the TEA Management System, review performance and communicate consult with workers in regards to HSE:

- Site Meetings (refer to section 14.2);
- Prestart Meetings; and
- Toolbox Meetings.

Meeting agenda and minutes will be recorded, maintained, and be made available when required.

5.1.5. Communication and Consultation of Risk

Communication and consultation of risk will be completed in accordance with section 7.

5.2. Community Communication and Consultation

The Section Manager or nominee will develop and maintain contact and open discussion with community members, groups and stakeholders during each operational phase of a specific project.

The Section Manager should be aware of changing community feeling and respond accordingly in a timely manner.

At the planning stage potential community impacts were identified and the potential issues that could arise as a consequence of TEA activities. The identified controls to minimise the impact on the community include:

- Communication notices i.e. letter drops
- Consultation with Community Groups and Stakeholders
- A Community Enquiry Register

Any written forms of communication that are developed to be released to the community must be approved by the Section Manager's Line Manager.

All communications received from external parties pertaining to the environmental aspects and impacts associated with the Site's works will be documented and correspondence filed into the ***Document Management System (DMS).*** All community complaints will be referred to the Section Manager or nominee or if neither of these are available the most senior person on site.

6. Hazard Identification and Risk Control

The following documents provide further information in regard to this topic:

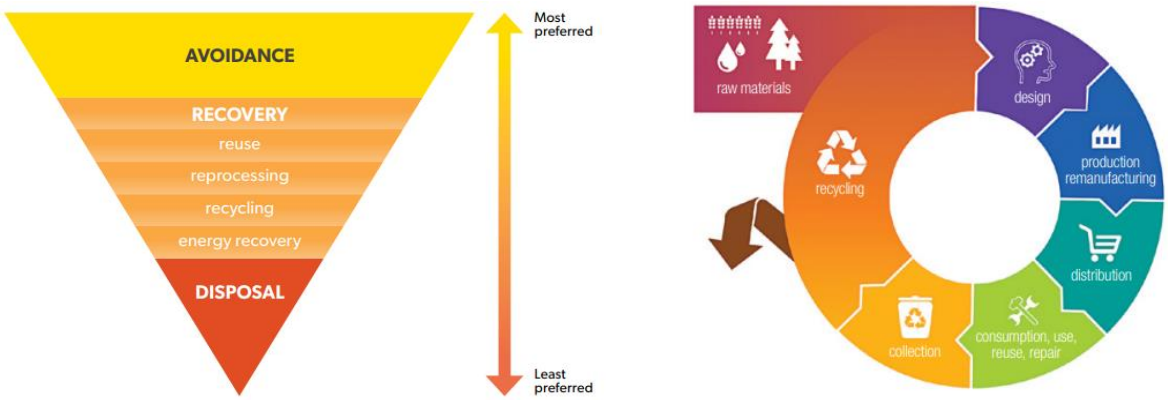
- *Critical Risk Management Standard*
- *HSEQ Risk and Operational Control Standard*
- *Permit to Work Procedure*
- *Safe Work Method Statement - Guideline*

6.1. Hierarchy of Control

The following hierarchy of control will be applied to controlling environmental risks and environmental aspects within TEA. This hierarchy recognises that the best controls act on the environment, not on the people in it. Waste minimisation will optimise resources and minimise the impact to the environment, whilst being cost effective. It is TEA's policy to recycle and/or re-use viable materials where practicable, considering transport costs, sale price and indirect savings, following the principles of the waste hierarchy:

Hazards/Aspects

Waste



Waste Hierarchy and Circular Economy Source: Waste Avoidance and Resource Recovery Strategy 2030

6.2. Site Environmental Risk Analysis

The Site Team has undertaken a construction risk assessment workshop (CRAW) and developed a *Project Risk Register* based on the Master Risk Register which incorporates the Company's mandatory controls and additional site specific hazards and controls identified in the CRAW. This Management Plan and the *Emergency Preparedness and Response Management Plan* have been based upon this *Project Risk Register*.

Works on site will be undertaken in accordance with the ***Project Risk Register.*** The ***Project Risk Register*** will be made available to workers.

6.3. Review of Risks

The aspects within the ***Project Risk Register*** will be reviewed for adequacy:

- At site meetings
- Prior to the commencement of any new construction work that involves high impact risks
- After a significant incident
- If there is a change made to the construction methodology the Environmental Management Plan & Risk Register will be updated as appropriate.

6.3.1. Change Management

The following documents provide further information in regard to this topic:

- ***Change Management Procedure***
- ***Safety in Design Procedure***

Where there is a change to the planned scope, design or construction methodology (including plant, machinery, materials, or sequence) the impact of the change must be assessed and a determination on whether the ***Change Management Procedure*** *and/or* ***Safety in Design Procedure*** applies. If so then a formal analysis of the change will be undertaken using the ***Management of Change Assessment Form.***

6.4. Operational Control

Operations and activities associated with significant environmental aspects will be planned to ensure they are carried out under specific operating conditions. A Safe Work Instruction/Operational Procedure, Safe Work Method Statement, Take Five, Hazard Report or a combination of these will be used to achieve this requirement.

6.4.1. Safe Work Instructions (SWIs) / Operational Procedures

Where a Safe Work Instruction (SWI)/Operational Procedure exists for a common activity undertaken by TEA, this will be used when developing the Safe Work Method Statement (SWMS) to provide guidance on the safe work methods, anticipated hazards/ aspects & associated controls and applicable Legislation, Codes and Guidelines.

6.4.2. Permit to Work

The following high-risk activities require written authority in the form of a “permit to work” from the TEA Site Team:

- Confined space entry
- Excavations classified as requiring a permit according to the **Excavation Permit Determination**. Note: A determination must be completed prior to undertaking any excavation
- Hot Work (for hot work conducted outside of designated workshop areas)
- Penetration of structures that may contain services

- Use of powered hand-held saws i.e. quickcut/demo, ring saw, chainsaw
- Work at heights where a person is exposed to a risk of falling 2 metres or more or where the level of residual risk is high for work at height below 2 metres
- High risk work to be conducted on a TEA site where "Authority to Commence Work" has deemed to be required by the Site's Manager
- Clearing of any vegetation (including on the riverbed) will require a Clearing Permit

No work involving these activities will commence until the appropriate permit has been completed. Person's issuing permits on the Site will be given training in the TEA Permit to Work system. A permit may be required for other high risk activities as determined by risk assessment, the Site's Manager and/or contractual requirements.

6.4.3. Safe Work Method Statement (SWMS)

SWMS will be completed for all high-risk construction work. SWMS developed will reflect the risks and controls identified in the sites risk register and supporting work instructions.

Subcontractors will be provided access to the *Project Risk Register* and prior to undertaking the work will be required to submit their SWMS (for high risk construction work) to TEA for review and approval using the *Subcontractor SWMS Compliance Assessment (available in Beakon)*.

6.4.4. Take 5

Take 5 booklets will be available to all workers to perform risk assessments for work that is not high-risk construction.

6.4.5. Environmental Hazard Reporting

Environmental Hazard reporting will be conducted using the Hazard Report (contained within the Hazard Report/Take 5 booklet).

The Supervisor is responsible for ensuring hazards are addressed in a timely manner, using the hierarchy of control, and communicated to those who may be potentially affected. Where hazards cannot be addressed immediately, and additional controls are required they are to be reported into the Beakon system for follow-up and close-out.

7. Environmental Aspects Management

The following environment aspects have been identified for the TEA Project within the *Project Risk Register*. An environmental sub-plan has been developed within this Management Plan to detail how the aspects will be managed to comply with relevant legislation & client requirements and identifies the controls and responsibilities to meet obligations. These Sub Plans establish an outline of how TEA will manage potential impacts to comply with relevant legislation requirements and identifies the controls and responsibilities to meet legally binding obligations.

7.1. Significant Environmental Aspects

- Waste
- Water
- Hydrocarbon and Chemical
- Flora & Fauna
- Air Quality and Dust
- Noise and Vibration
- Weed, Pest and Disease

The Project CRAW will assess and consider the life cycle perspectives of its procurement activities and the different life cycle stages that can be control or influenced. Typical stages of a product or service that may be considered include - raw material acquisition, design amendment, production, transportation/delivery, use, end-of-life treatment and final disposal.

7.2. Environmental Aspects

- Cultural and Heritage areas
- Fire
- Soil/Materials Management

8. Closure and Commissioning

At completion of this project, TEA will hand over the site in an environmentally responsible state, taking into account the nature of the works in accordance with legislative & contractual requirements.

9. Training, Competency and Resourcing

Training will be completed in accordance with the *Health and Safety Management Plan*.

10. Incident, Emergency Preparedness and Response

The following documents provide further information in regard to this topic:

- *Emergency Preparedness and Response Standard*

10.1. Emergency/Incident Planning and Control

The site has in place an *Emergency Preparedness and Response Management Plan (ERMP)* that addresses emergency response, control and recovery based upon credible emergency scenarios as identified in the Site Risk Register. The *ERMP* has been developed in accordance with *Emergency Preparedness and Response Standard*.

11. HSE Reporting and Investigation

The following documents provide further information in regard to this topic:

- *HSE Reporting and Investigation Procedure*

11.1.Notifications and Reporting

The Section Manager is accountable for ensuring all necessary reporting and notifications take place in accordance with this plan and the *HSE Reporting and Investigation Procedure*.

11.1.1. Internal

The HSES Manager or their delegate will be responsible for reporting all incidents into *Beakon* database. Incidents reported into *Beakon* will be reviewed by the Responsible Manager.

11.1.2. Notification of Incidents to MRWA

MRWA will be notified of any significant TEA incident within 24 hours. Copies of the TEA incident reports and investigations incident will be made available upon request.

11.1.3. Statutory Notifications

In the event that there is a reportable incident to the Regulatory Authority (DWER), the HSES Manager will report the incident to the Regulatory Authority.

11.2.Investigations

Investigations regarding the incident will be completed in accordance with the *HSE Reporting and Investigation Procedure* and commence as soon as practicable (preferably immediately) but within 24 hours.

11.3.Review and Communication of Incidents

Incidents will be reviewed to check that causal factors and root causes were identified and that the findings have been effectively addressed through assignment of action/s at the:

- Site monthly meetings
- Business Unit meetings
- OHS Committee Meeting (if established)

Actual and potential class 1 incidents will be reviewed by senior management to ensure adequacy of closeout. HSE incidents and their preventative actions/learnings will be communicated at prestart meetings, toolbox meetings and through HSE alerts/bulletins as per section 5.

12. Environmental Reporting

12.1.Reports

The HSES Manager, is responsible for the preparation and submission of the *Project HSEQ Performance Review Minutes* / NGERS Report to MRWA.

12.2. Site Meetings

The Site will hold meetings in accordance with the *Health & Safety Management Plan.*

12.3.Project Performance Review

At completion of the Project, the Section Manager is responsible for arranging a review of project performance which will include HSE management performance and lessons learnt for the purpose of continually improving TEA Management Systems. This review will be in accordance with the *Project Close-Out Procedure*.

13. Auditing, Reviews and Inspections

The following documents provide further information in regards to this topic:

- *Auditing, Reviews and Inspections Standard*

13.1.Inspections

13.1.1. Workplace

The HSES Manager, is responsible for ensuring Workplace Inspections an inspection schedule is maintained and inspections are completed in accordance with *Auditing, Reviews and Inspections Standard* . The schedule will dictate the frequency required for each type of inspection to be carried out.

13.1.2. Environmental Inspections

The following inspections will take place on site:

- Environmental Inspections Weekly.

13.2.Audits and Reviews

The TEA Quality Manager is responsible for maintaining an Audit Programme for the organisation (including projects/facilities) in accordance with the TEA *Auditing, Review and Inspections Standard.*

13.3.Corrective Actions

Corrective actions identified through hazards, inspections, incidents, auditing will be recorded in *Beakon*. Close out of corrective actions are monitored through Site meetings and reported to senior management through the monthly and quarterly board reports.

14. Document and Record Control

TEA's Health, Safety and Environment Policies, Standards, Procedures, Safe Work Instructions, References, Guidelines, Forms, Templates are all accessible via the *Company's Intranet - GENIE*. *GENIE* will maintain the current and only authorised versions for use.

Environment Management documentation that has been specifically developed for the site will be controlled on site and recorded on the *Site Document Register* in accordance with the *Site Quality Management Plan.*

The Section Manager is the owner of this plan and will apply change control to ensure the most recent plans are approved and executed.

15. Appendices

- Appendix 1 - Acceptance of Environmental Accountabilities & Responsibilities
- Appendix 2 - Waste Management Sub Plan
- Appendix 3 - Water Management Sub Plan
- Appendix 4 - Hydrocarbon and Chemical Management Sub Plan
- Appendix 5 - Flora & Fauna Management Sub Plan
- Appendix 6 - Cultural & Heritage Management Sub Plan
- Appendix 7 - Soil/Materials Management Sub Plan
- Appendix 8 - Air Quality and Dust Management Sub Plan
- Appendix 9 - Noise and Vibration Management *Sub Plan*
- Appendix 10 - Weed, Pest and Disease Management Sub Plan
- Appendix 11 - Fire Management Sub Plan
- Appendix 12 – Environmental Survey

15.1.Appendix 1 - Acceptance of Environmental Accountabilities & Responsibilities

Position	Name	Signature	Date
Alliance Director	Peter Hopfmueller		
Construction Director	Kevin Garry		
Section Manager	Michael Mills		
Project Engineer	Vinh Lee		
Superintendent	Michael Patients		
Supervisor	Brani Uremovic		
HSES Manager	Nick Kemp		
Environmental Manager	Yossarian Taylor		

15.2.Appendix 2 - Waste Management Sub Plan

Appendix 2 - Waste Management Sub Plan			Responsibility
Objectives & Targets	• Refer to the Site Objectives & Targets (Section 3 of this EMP)		Section Manager
Performance Criteria	100% Compliance with Client & legal requirements 100% achievement with Site Objectives & targets		Section Manager
	Training and Competency	• As part of the Site Induction, workers will be informed of: • The types of waste generated on site; • How the wastes are to be handled, stored and disposed of. • Personnel responsible for clean-up of spills will be provided with instruction on how to use the sites spill kits. • Personnel handling hazardous materials will be provided training to read and understand the SDS.	Section Manager
	Unidentified Waste	• Wastes that cannot be positively identified (i.e. unlabelled liquids, potential asbestos) will be tested before handling and disposal. Any material that is unknown should be considered hazardous until positively identified.	Project Engineer
	Handling	• Where practicable, dust generating rubbish and debris will be removed to minimise dust release into the atmosphere. • Handling of waste will be done in accordance with relevant state or local by-laws using suitable personal protective equipment. • Debris from first and subsequent storey's at site is to be removed by means of either a hoisting appliance or a completely enclosed chute discharging into disposal hoppers or into an area which is completely enclosed by a hoarding that is at least 2 metres in height.	Project Engineer
	Storage	• Containers used for storage are not to be opened, handled, transported or stored in a manner that may rupture the container.	All

		• All waste will be stored in waste receptacles and removed off site by a licensed contractor on a periodic basis. • Dedicated recyclable and hazardous receptacles will be labelled. • Wastes stored on site will be stored in a manner to prevent the attraction of vermin and native wildlife. • Waste is to be stored away from access and egress routes. • The quantity and volume of wastes stored on site may be minimised where reasonably practical to reduce the risk to health, safety, and the Environment. • Section Managers will be responsible for identifying and obtaining any required licenses and/or permits to store wastes.	
	Disposal	In deciding how to dispose of waste generated on site, consideration will be given to reducing, reusing, or recycling waste where reasonably practical to minimize the volume sent to landfill. Where reuse or recycling is not a feasible option, the waste will be sent to a facility capable of accepting the waste. • The burning of any type of wastes will not be permitted on any TEA site. • The use of stormwater drains for the disposal of waste is prohibited.	Project Engineer
	Transportation	• The removal and transportation of hazardous waste/ controlled waste (e.g., asbestos, hydrocarbons, and sewage) for disposal will only be conducted by licensed carriers. Licensed operators will be engaged in accordance with the *Procurement Procedure*. • Before a hazardous waste/ controlled waste is transported off site, a waste tracking receipt will be collected from the operator as verification that the waste was correctly transported off site and to identify the proposed location for disposal. The receipt will be scanned and filed into the DMS and linked to the Site Waste Register. A copy of the receipt will be held for a minimum of 3 years. • The transportation of other wastes for disposal will only be conducted if the load is covered or there is no risk of load/debris falling and the load is disposed of at a registered landfill.	Section Manager
	Hazardous Waste - General	• Hazardous wastes will be stored in sealed containers where practical and clearly labelled with waste type. • Hazardous waste receptacles will be maintained in good condition to prevent leaks or spills.	All

		• Offensive odours should not be generated at any time when stored. • Hazardous wastes with a significant risk to human health and safety will be stored in containers that comply with relevant legislation and guidelines. • Hazardous wastes will not be permitted to accumulate to a level that presents an unreasonable risk to human health, safety, or the environment. Controlled waste storage will be suitably contained to ensure debris does not travel beyond the boundary of the premise. • Hazardous waste will be stored and segregated in accordance with their SDS. Hazardous waste will be risk assessed to ensure they do not contaminate or interact with goods that are incompatible. Where there may be a risk of fire, hazardous waste will be segregated to prevent storage incompatibilities. • Hazardous liquid waste will not be permitted to enter the environment. • Design considerations for secondary containment will be given to the storage of liquid wastes to contain any potential spills. Hazardous waste will be stored on/in bunded pallets/areas which will be compliant with AS1940-2004 4.4.3 (the bunded pallet/area must have the capacity to contain 110% of the largest container. • Hazardous waste such as batteries, hydrocarbons, sewage, and asbestos will only be handled for final disposal / recycling by certified waste removing contractors. Sewage waste not plumbed directly into the main sewerage system will be contained within holding tanks on site compounds and emptied on a periodic basis or as required by a licenced contractor. • The management and handling of hazardous waste will be in accordance with the Company's *Hazardous Chemicals Procedure*.	
	Hazardous Waste Sanitary/ Sewage Waste	• Sewage waste will either be plumbed directly into the main sewerage system or contained within holding tanks on site compounds and emptied as required. • Sewage waste stored in bunded tanks underneath the toilets will be emptied by a licensed contractor on a periodic basis. • Sanitary wastes will be stored in solid containers and clearly labelled for identification. • Sanitary wastes will not be re-handled after disposal to minimise the exposure and risk of double handling.	Project Engineer

		• Sanitary conveniences will be calculated based on the number of workers based on the site and meet legislative requirements. • Sanitary waste will be stored away from food sources or where food is served. • Controls to prevent offensive odours to the public and workers will be implemented.	
	Recyclable Waste	• On site waste will be put into a comingled bin and transported to a recycling facility and segregated as appropriate. • Waste will be collected by a provider who segregates recyclable waste from general waste at its recycling facility. • Green waste will be mulched for use in dust control if practicable.	Project Engineer
	Waste Water	• Any wastewater or liquids must be disposed of to an approved receptacle and stored within an approved bunded location until they are removed from site.	Project Engineer
	Concrete	• Kibbles / Concrete truck are to be washed out into a designated bunded area. When the concrete is dried it will be disposed of with general waste. • At no point will any Concrete truck or kibble be permitted to wash out at any point other than the designated area with all the associated controls in place.	Project Engineer
Environmental Inspections & Monitoring	Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings and as part of the MRWA monthly report.		Section Manager

Appendix 3 - Water and Stormwater Management Sub Plan

Appendix 3 - Water and Stormwater Management Sub Plan			Responsibility
Objectives & Targets	• Refer to the Site Objectives & Targets (section 3 of this EMP)		Section Manager
Performance Criteria	100% Compliance with Client & legal requirements 100% achievement with Site Objectives & Targets		Section Manager
Mitigation Measures	General	• Water should be conserved, reused and recycled where reasonably practical. • At no point will any water utility asset owner's infrastructure be modified or removed without their approval.	Section Manager
	Training and Competency	• As part of the Site Induction, workers will be informed of any significant water aspects and Site specific controls to minimise potential impacts. • Emergency Management Team members will be provided training to respond to a discharge of contaminated water or hazardous substances into the environment.	Section Manager
	Notification	• The Site will not modify or remove any water utility assets without their approval. Notification of approval will be received by the MRWA with a copy of authorisation. • Notification to the asset owner will be given as per their conditions of compliance.	Project Engineer
	Stormwater	To control stormwater run-off to minimise potential environmental impacts the following controls will be applied: • Installation of soak-wells • The project will construction a stormwater retention / infiltration basin in the northern section of the project boundary. The RL elevation in the south will be constructed higher RL22.80 vs the RL 21.94 in the south. This will ensure that surface water flows are directed from south to north into the infiltration basin.	Project Engineer

		An earth bund will be installed around the site. This will assist in the direction of surface flows northbound to the infiltration basin. Refer to image below:	


EXISTING
RL 21.54
BUND RL 22.60
BASIN RL 21.00
RL 21.87
RL 22.19
RL 21.94
FOOTPRINT OF
TONKIN
EXTENSION
ALLIANCE
OFFICE
COMPOUND
DRAIN
RL 21.60
RL 22.20
RL 22.37
RL 22.42
DRAIN
RL 21.60
EXISTING
RL 21.80
KARGOTICH ROAD
APPROX RL 22.20
AMENDMENTS
No.
DESCRIPTION
APPROVED & DATE
DISCLAIMER: PLAN TO BE USED FOR INFORMATION ONLY
SERVICE INFORMATION TO BE CHECKED AND CONFIRMED WITH LOCAL AUTHORITIES SERVICE REPRESENTATION ON
PLAN SHOULD BE LOCATED BY A SERVICE LOCATOR PRIOR TO EXCAVATION AND CONFIRMED BY DIALING 1100
METADATA
COORDINATE SYSTEM
VERTICAL DATUM
SURVEYED BY
DATE OF SURVEY
DRAWN BY
12D PROJECT
DRAWING TITLE
NOTES
Proposed Kargotich Compound
Drainage Plan
DRAWING NUMBER PLOT-002
REVISION
STATUS
HORIZONTAL SCALE 1:600 VERTICAL SCALE 1:600
mainroads
TONKIN EXTENSION
ALLIANCE
Tonkin
Extension
Alliance

	• Additional measures include: – Minimise contours/elevations to reduce stormwater flow and divert runoff around the site – Stabilisation of disturbed areas through the use of mulching or revegetation – Installation of diversion berms. – Water were practicable will be diverted around disturbed areas, including waste storage, and handing areas.		
	Stormwater	Where temporary erosion protection is installed for additional inflows or point source discharges, the existing soils excavated from the watercourse will, where practicable, be stockpiled in an approved location above the high bank so it can be replaced following removal of the temporary protection measures. Control measures to prevent contaminated stormwater run-off (e.g., stormwater affected by site's storage of chemicals, refueling area, waste receptacles) from entering stormwater drains or natural water courses will be: • Chemicals and hazardous substances to be stored in bunded areas • Site compounds and laydown areas to be located away from stormwater or natural watercourses where practicable. Any contaminated stormwater captured in a retention basin will be disposed as per the waste management sub-plan or be treated to remove sediments and pollutants before being discharged into the receiving environment.	
	Groundwater Bores	• All applicable licence, approvals and permits will be obtained from the DWER authority before the installation of bores. • Extraction of groundwater from underground aquifers must not directly or indirectly cause environmental harm to any watercourse, lake, wetland, or spring. • The extraction of water from bores will be monitored as per conditions of compliance, and recorded using *Water Abstraction Log* • When there is not a specified condition of compliance, and a flow meter is not installed the Water Cart Operator will complete the Water Abstraction Log every time the bore is used. The Water Cart Operator will record the full capacity (litres) of the Plant on each occasion it is filled to ensure water extraction is not underestimated.	Project Engineer

	Trench / Excavation Water	• Sediment laden water accumulated in trenches or excavations must not be discharged directly or indirectly to any stormwater or natural watercourse. • A suitable location to discharge will be identified considering site slope, proximity to drainage lines, soil permeability and ground cover i.e., well established existing vegetation. If necessary, consideration will be given to the use of geofabric or clean rock to assist in the prevention of erosion during discharge.	Project Engineer
	Sediment Basins	In circumstances that sediment basins are required to be emptied then the following controls will be applied: • Assessing water quality to determine if it is inside the State's water quality guidelines • Apply flocculent as required and verify results within water quality guidelines • Identifying a suitable location to discharge, considering site slope, proximity to drainage lines, soil permeability and ground cover i.e., well established existing vegetation. If necessary, consideration will be given to the use of geofabric or clean rock to assist in the prevention of erosion during discharge • Set and regulate the dewatering rate to avoid offsite run off or run off to any nearby drainage line • Discharge to be continually monitored.	Project Engineer
	Plant/Vehicle Maintenance	• The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas from which contaminants can be released into stormwater or natural watercourses.	All
	Discharge of Contaminated Water and Hazardous Substances	Contaminated water and all other hazardous substances will not be discharged into the environment. In the event that the Site is directed to discharge contaminated water or other hazardous substances the Section Manager will obtain documented evidence that approval has been obtained from the local council or environmental department before discharging contaminated water or hazardous substances into the environment. .	Project Engineer
Environmental Inspections & Monitoring	Monthly/Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings and as part of the MRWA monthly report.		Section Manager

15.3.Appendix 4 - Hydrocarbon and Chemical Management Sub Plan

Appendix 4 - Hydrocarbon and Chemical Management Sub Plan			Responsibility
Objectives and Targets	• Refer to the Site Objectives & Targets (section 3 of this EMP)		Section Manager
Performance Criteria	100% Compliance with Client & legal requirements 100% achievement with Site Objectives & targets		Section Manager
Mitigation Measures	General	• TEA will develop a site plan (i.e. a diagram) showing the location of storage areas, spill kit locations, muster points, firefighting equipment and First Aid equipment including eye wash/flush locations. • In the event of an emergency that involves the need for emergency services this site plan along with a product manifest is available to the emergency services.	Section Manager
	Training and Competency	• As part of the Site Induction, workers will be informed of the Site specific controls required to manage hydrocarbon and chemical storage and use including: • Use and understanding of safety data sheets (SDS) • Use of personal protective equipment (PPE) • Emergency Management Team members will be provided training to respond to a hazardous substance spill	Section Manager
	Register	*ChemAlert* will be used to register all site dangerous goods and hazardous substances, manage electronic SDS and conduct and record product risk assessments Consideration will be given to substitute products assessed as a high-risk with a product of lesser risk	Section Manager/Superintendent

	Transportation	Containers holding hazardous substances or dangerous goods will be stored upright and secured during transport. Containers are not to be dropped, tip or rolled sides. • The transportation of dangerous goods will be by licenced carriers.	Project Engineer
	Handling & Use	Handling of products will be subject to the following requirements: • Hazardous substances and dangerous goods will be clearly labelled • Current SDS (no older than 5 years) will be readily available when handling • Used oily rags, oil filters and other left-over hydrocarbon and chemical products hall be stored in a designated area and removed by licensed carriers to either recycle or otherwise dispose of.	All
	Refuelling	• Refuelling of plant and vehicles must be monitored continually and conducted in designated areas away from sensitive receptors. • All in field refuelling must have a spill kits available to contain and clean up any spills. • Spill kits shall be stored in designated & labelled containers and include a stock control register • All refuelling areas must be signed to prevent smoking or naked flame • Vehicles must be switched off when refuelling and the use of mobile phones prohibited • Fixed refuelling areas must have a plastic lined refuelling area • Fuel storage containers must be of a double bund construction	All
	Site layout	• TEA will develop a site layout plan (i.e. a diagram) showing the location of storage areas, spill kit locations, muster points, firefighting equipment and 1st aid equipment including eye wash/flush locations. • This site layout plan must be current and displayed at the work site at all times throughout construction.	Section Manager

		• In the event of an emergency that involves the need for emergency services this site plan along with a product manifest must be provided to the emergency services	
	Storage of Hazardous Materials	• Any Dangerous Goods and/or Hazardous Substance must be stored in designated areas compliant with statutory and industry codes of practice • Quantities of hazardous materials should be kept to a minimum, commensurate with their usage and shelf life. • Safety Data Sheets of stored hazardous materials will be readily accessible at the place of storage/site office. • Permanent and temporary containers that hold hazardous materials must be labelled with the appropriate signage. • The volume and types of hazardous materials stored must be known, current and documented and must not exceed the design capacity of the storage area. • Storage and containment areas (including secondary containment) must be inspected for signs of loss or damage and any deficiencies must be addressed. These areas must be inspected at least monthly as part of the workplace inspection • Hazardous materials no longer in use must be identified and assessed to determine if they should be removed from site. • Hazardous materials storage areas must be kept clear of combustible material, vegetation and refuse by a minimum of three metres.	All
	Spill/Emergency Response	In the event of a spill the following generic procedure must be followed, • Do not put yourself at risk. • Notify personnel in the immediate area and remove yourself and others from danger. • Report ALL SPILLS immediately to the Supervisor and HSE Advisor/HSE Representative (report location, type and extent of incident)	All

		Refer to the *Emergency Preparedness and Response Management Plan* for guidance on spill response. • Any uncontrolled release of hazardous substances which cause actual or threatens potential serious or material environmental harm will be reported in accordance with the State Regulatory DWER.	
	Workplace Inspections	• Hazardous Materials storage and use will be inspected monthly as part of workplace inspections & within the Environmental checklist.	Supervisors
	Contaminated Sites	• In the event that any area within the project site is deemed as contaminated by DWER, the Project Engineer will be advised by suitably qualified personnel on ongoing monitoring of the site for the duration of the works or as required.	Project Engineer
Environmental Inspections & Monitoring	Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings and as part of the MRWA monthly report.		Section Manager

15.4.Appendix 5 – Flora and Fauna Management Sub Plan

Appendix 5 - Flora & Fauna Management Sub Plan		Responsibility
Objectives and Targets	Refer to the Site Objectives & Targets (section 3 of this EMP)	Section Manager
Performance Criteria	100% compliance with Client & legal requirements 100% achievement with Site Objectives & Targets	Section Manager
Environmental Context	The vegetation found within the project area is described as *Casuarina obesa* (Swamp Sheoak) over introduced grassland species. The TEA Environmental Manager undertook a site survey on the 24th March 2025 at the proposed office location. He noted the vegetation was of low value, several of the Sheoaks appeared stressed and in poor condition, whilst one was close to death. Although the trees are possible foraging habitat for some bird species in the area, none of the trees were found to have any nests or hollows. There were 14 trees noted, a photo is provided below, and a full list of the photos are provided in appendix one. A service station is being built to the north of the sites, whilst Karotich Road is found due east of the site. Its southern and western boundaries are surrounding farmland. An example of an isolated tree (*Casuarina obesa*) identified during the survey at the project site is provided below:	

	 Trees on the site were recorded as part of the options analysis (refer Appendix 12).		
Mitigation Measures	General	Vehicles, equipment, plant, materials and personnel are to remain within the designated construction area at all times and not breach established environmentally sensitive exclusion zones.	All
	Training and Competency	• As part of the Site Induction, workers will be informed of the Site specific controls required to minimise potential impacts and protect flora and fauna including: • the requirement to work within the designated disturbance zones; • requirement to recognise protected flora or fauna species identified to be found on the site; • tree protection zones; • Specific licence conditions applicable to the Site.	Section Manager
	• Fauna • Endangered, Vulnerable and	Oakford is within the known distribution to all three Black Cockatoos. The EPBC Act 1999: referral guidelines for the three threatened black cockatoo species (DSEWPaC 2012) states that the following impacts have a high risk of a significant impact upon Black-cockatoos:	All

	Near Threatened Animal Breeding Places	• Clearing of any known nesting tree • Clearing or degradation of any part of a vegetation community known to contain breeding • habitat • Clearing of more than 1 ha of quality foraging habitat. • Clearing or degradation of a known night roosting site. • Creating a gap of greater than 4 km between patches of black cockatoo habitat. The project area is 180m across. There are many scattered trees in the surrounding farmland habitat and as such a 4km gap is not created. With reference to the referral guidelines the following information is provided: • No nesting trees were noted in the project area during the site inspection. • The vegetation community (scattered Sheoaks over farming grassland) does not contain breeding habitat for Black Cockatoos. • Although, the trees are known to be foraging habitat, the scattered trees to be cleared are in poor health and only 0.23ha in area. • the project does not contain breeding habitat for Black Cockatoos (there are no Eucalypts with hollows) • No night roosting sites were found during the site inspection. • removal of potential foraging habitat within the DE will not create a gap greater than 4 km between patches of Black Cockatoo habitat, with the project area being approx. 180m from east to west, there are many scattered trees immediately surrounding the project site on farmland.	
	Authorisation & Compliance	• TEA will not clear vegetation without written permission from DWER in the form of a Clearing Permit of Clearing Exemption. All clearing works under a permit, approval or licence will be compliant with the conditions of permit, approvals or licence and within the predetermined area.	Project Engineer

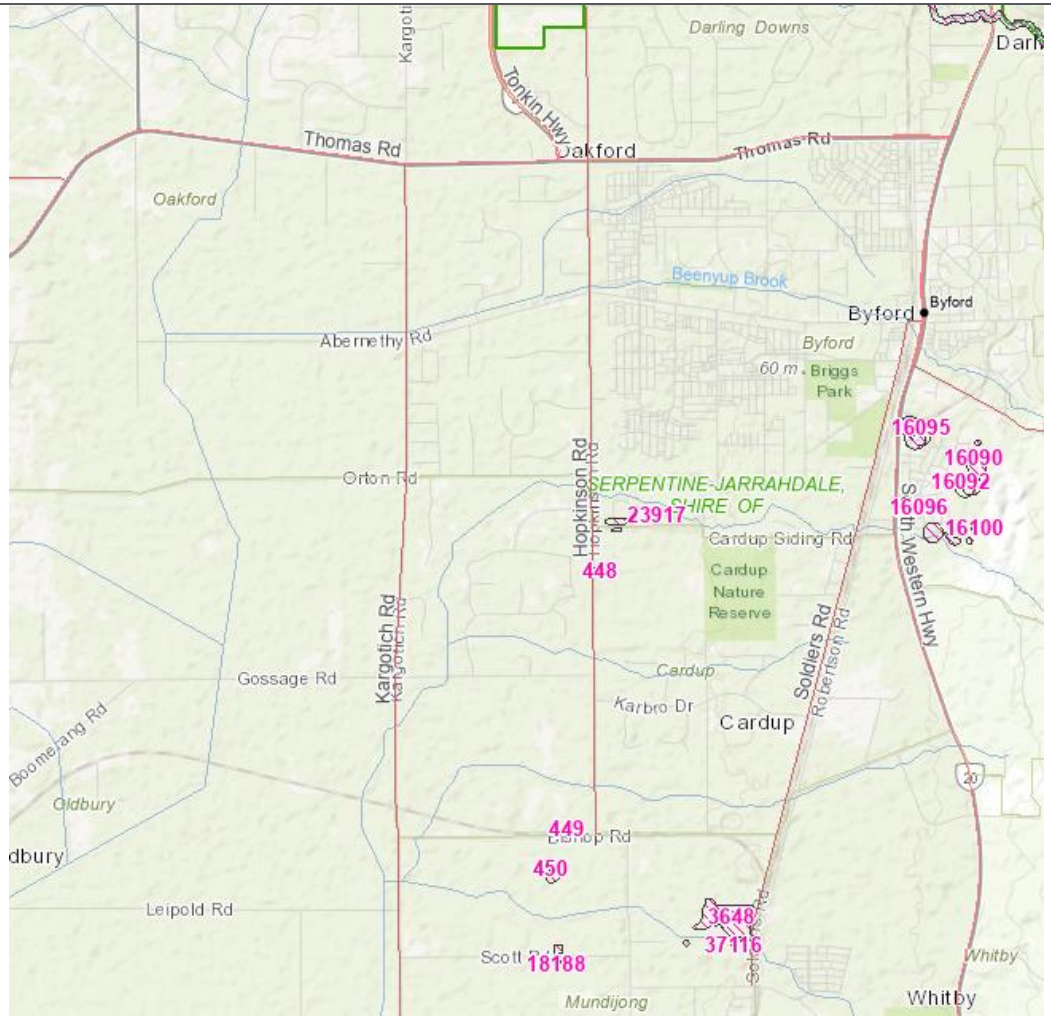
		• In the event of any unauthorised clearing, works will cease immediately and the Section Manager, client will be notified. Unauthorised clearing of areas will be investigated in accordance with section 15 (HSE Reporting and Investigation). Work may only recommence following written confirmation from the Client. The Section Manager will be responsible for authorising the recommencement of works.	
	Marking	• The Project Engineer will ensure the area to be cleared is clearly marked (e.g., pegging) and areas of vegetation or trees nominated to be excluded from the clearing works are to be visually identifiable to all personnel involved in the works. • The method of marking is to be communicated to all persons involved in the clearing process. All control measures are to be communicated to personnel involved in the tasks.	All
	Flora	• Native vegetation should be protected where reasonably possible. Large areas that are to be protected from Site works will be demarcated to prevent intrusion and disturbance. This requirement is to be communicated to personnel involved within the site area. • When the pruning of trees is to be undertaken that are to be protected, it will be done by suitably qualified personnel only. Where branches are trimmed an assessment of the trees ability to survive should be conducted by a suitably qualified person and adequate area around the tree in accordance with AS4970:2009 Protection of trees of development sites. • Trees should be felled into the construction site or in slots between stands of trees, where practical, to minimise damage to other trees during the clearing process. Machinery contact with standing trees on vegetated margins is to be avoided. • The clearing of vegetation outside the construction area will not be permitted except in the event of an emergency or as directed by emergency services. • Cleared vegetation will be stockpiled on site and will not be intentionally burnt without the written consent of the Client or Local Authority. Where practicably possible,	All

		stockpiles of vegetation should be reused or recycled. Any disposal of vegetation to landfill will be conducted in consultation with the Client and in compliance with Waste Management Procedure.	
	Fauna	• If fauna is confirmed to be present onsite during clearing, clearing works should proceed with care to enable the fauna to relocate freely. Clearing is to be conducted in a sequential manner and in a way that encourages escaping wildlife away from the activity into adjacent natural areas and not across roads or into other areas of threat (e.g., trench).	All
	Trenches	• All open excavations and trenches will be visually inspected on a daily basis for trapped fauna. Surveillance must occur along the entire length of the trench or excavated area and not merely those areas described as fauna habitats or sensitive areas. Open trenches are to be checked for fauna immediately prior to backfill, and any trapped animals removed by authorised fauna handlers. • The following measures are suitable to prevent fauna entrapment within any excavation or trench: – minimising the period of time, the trench/excavation is open – providing slopped access and egress points every 30 meters – using pipe caps to prevent fauna from entering pipes • installing additional trench plugs at greater than normal frequencies in areas identified as known or potential wildlife habitat (e.g., native forest areas)	All
	Fauna Handling	• Fauna will not be intentionally harmed or maimed under State wildlife protection legislation. This includes aquatic and terrestrial fauna (land and air animals). • Workers are not authorised handle/to be in possession of native fauna. The trapping and handling of fauna, in particular dangerous species will only be undertaken by a competent, qualified fauna handler. • All fatalities or injuries to fauna will be reported in accordance with the ***HSE Reporting and Investigation Procedure***.	All

	Fire Management	• TEA will not set fire to bush or use spark generating machinery (e.g., graders) during a prohibited or restricted burning time. • If safe to do so, TEA will extinguish any bush fire within the site boundary and request help from authorities if necessary. Fire breaks will be established as requested by authorities.	Section Manager
Environmental Inspections & Monitoring	Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings and within the MRWA Monthly Report.		Section Manager

15.5.Appendix 6 – Cultural and Heritage Management Sub Plan

Appendix 6 - Cultural & Heritage Management Sub Plan		Responsibility
Objectives & Targets	• Refer to the Site Objectives & Targets (section 3 of this EMP)	Section Manager
Performance Criteria	100% Compliance with Client & legal requirements 100% achievement with Site Objectives & targets	Section Manager
Cultural Context	A desktop review was undertaken on the Aboriginal Cultural Heritage Inquiry System, the search showed that there were no known cultural heritage sites within the project area. A snippet is provided below of the desktop search:	



	General	• Maintain the integrity of the cultural (European & Indigenous) aspects of the Site	Section Manager

Mitigation Measures	Training and Competency	• As part of the Site Induction, workers will be informed of any identified cultural or heritage aspects on the TEA overall site and any specific controls to be adhered including: – Management practices when working near protected areas – Respecting Indigenous Heritage Sites – Reporting requirements – TEA personnel will participate in the Company's cross cultural awareness training for employees	Project Manager
	Unexpected finds	• In the event that an artefact or remains are found: – The works in that area will cease immediately – The Section Manager and MRWA must be notified – The site must be made secure, a buffer zone of ten meters is recommended – All work at the unexpected find location must cease – The site must be made secure, a buffer zone of ten meters is recommended – MRWA to provide management recommendations. • TEA will notify all site personnel of the object and/or area and proposed treatment of that object and/or area as soon as possible, but prior to commencing work on the next working day. • Works will not continue until written approval has been received from the client.	All
Environmental Inspections & Monitoring	Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings and within the MRWA Monthly Report.		Section Manager

15.6.Appendix 7 – Soil and Materials Management Sub Plan

Appendix 7 – Soil and Materials Management Sub Plan			Responsibility
Objectives & Targets	• Refer to the Site Objectives & Targets (section 3 of this EMP)		Section Manager
Performance Criteria	100% Compliance with Client & legal requirements 100% achievement with Site Objectives & targets		Section Manager
Mitigation Measures	General		Section Manager
	Training and Competency	• As part of the Site Induction, workers will be informed of the Site-specific controls required for soil management.	Section Manager
	Approvals	• TEA will not commence any ground disturbance activity without a valid Ground Disturbance Permit (GDP) and the implementation of controls as specified within the GDP.	Project Engineer
	Topsoil Management	• The top 50-100mm of topsoil should be initially stripped and set aside for rehabilitation purposes. • Topsoil will not be stripped and stockpiled in wet conditions if possible. This is to maintain the integrity and quality of the soil. Stockpiles of topsoil will not be higher than 2m and no higher than 4m for sub-soil • All stockpiles will be surveyed, and information will be recorded such as quantities, source coordinates and date stripped • Topsoil stockpiles will be constructed to minimise soil loss from run-off and prevent erosion • Topsoils contaminated with weeds will be placed/located separately from clean stockpiles.	Project Engineer

		• To minimise airborne dust from topsoil stockpiles, non-saline water will be applied to stabilise the surface. Surfaces will be checked to ensure crusting does not inhibit seed germination, which also serves to reduce wind erosion.	
	Erosion and Sediment Controls	• Consideration will be given to the following when developing ESC plans: – Seasonal conditions – Soil types, particularly dispersive soils, sodic and saline soils – Local hydrology affecting the worksite; and – Local drainage, including temporary and overland flow paths. • The accepted methods of control are as follows but not limited to: – Minimising clearing – Minimise duration of soil exposure – Early installation of drainage and erosion and sediment control measures – Protection of exposed soil surfaces from erosion (by application of dust suppressants, geofabric, jute mesh, mulch or seeding where practicable) – Onsite capture of sediment – Regular auditing of erosion and sediment controls on site, including post rainfall inspections – Progressive stabilisation and revegetation of disturbed areas. • Any runoff from site will comply with the State's water quality parameters.	
Environmental Inspections & Monitoring	Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings and within the MRWA Monthly Report.		Section Manager

15.7.Appendix 8 – Air Quality and Dust Management Sub Plan

Appendix 8 - Air Quality & Dust Management Sub Plan			Responsibility
Objectives & Targets	• Refer to the Site Objectives & Targets (section 3 of this EMP)		Section Manager
Performance Criteria	100% Compliance with Client & legal requirements 100% achievement with Site Objectives & targets		Section Manager
Mitigation Measures	General	Site related dust, identifiable fumes, odours and vapours will not infringe beyond site boundaries where practical	Section Manager
	Training and Competency	• As part of the Site Induction, workers will be informed of the Site specific controls required for air quality and dust management including: • Correct use of PPE • Use of monitoring equipment • Methods to control dust	Section Manager
	Greenhouse Gases	• Regular maintenance of plant and equipment for optimum performance will be undertaken to keep emissions to a minimum and increase plant productivity. Maintenance of Plant and equipment will be in accordance with the *Plant, Equipment and Vehicle Maintenance Procedure* • Vehicles and equipment must be fitted with appropriate emission control equipment and routinely maintained. Plant should be switched off when not in use, wherever practicable • All plant, equipment and vehicles are to be regularly monitored and maintained and records kept of maintenance. Engine tampering to increase power output is prohibited • Air emissions from plant, vehicles and equipment should be visually monitored throughout construction	Section Manager

		• Insert clients National Greenhouse Emission Reporting Scheme (NGERS) reporting requirements	
	Dark Smoke	• All internal combustion engines will be regularly serviced to ensure optimum operation and minimise the volume of visible smoke emitted. Any Plant or light vehicles emitting unreasonable smoke (concentrations higher than normal operation) will cease operation and be serviced by a trained and qualified technician. • Materials on site will not be burned intentionally without consulting and obtaining the authorisation of the relevant Local Shire, Fire Authority and Client. The burning of any material on site should be a last option after alternative methods have been considered.	All
	Dust Monitoring	The following dust monitoring methods will be applied on the Site: • Obtaining weather reports from the Bureau of Meteorology (BOM) website • Visual inspection	Project Engineer
	Dust Control	Dust control methods to be applied on the site to keep dust generated within the site boundaries, as reasonably practicable, will be: • Application of water/dust suppressant via water carts • Physical application of ground cover, where required. • Cessation of works in extreme adverse weather conditions • Restricted speed limits on site • Reschedule dust generating activities to avoid adverse weather conditions • Communicate dust risk and mitigation measures to staff prior to commencing work	All
	Fumes, Odours and Vapours	• The Site will endeavour to keep the generation of emission of unreasonable levels of fumes, odours and vapours to a minimum. Refer to the Waste Management Sub Plan and Hydrocarbon and Chemical Environmental Management Sub Plan which detail storage and handling controls that minimise fumes, odours and vapours.	All

Environmental Inspections & Monitoring	Monthly/Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings and within the MRWA Monthly Report.		Section Manager

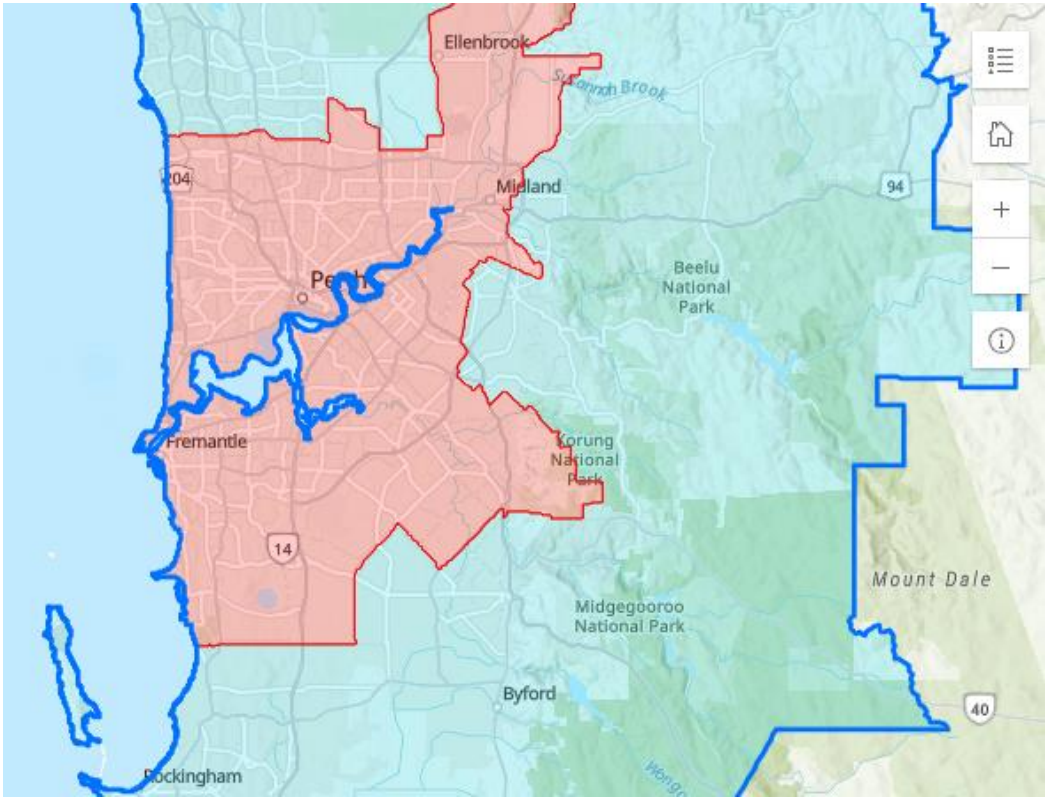
15.8.Appendix 9 – Noise and Vibration Management Plan

Appendix 9 - Noise and Vibration Management Sub Plan			Responsibility
Objectives & Targets	• Refer to the Site Objectives & Targets (section 3 of this EMP)		Section Manager
Performance Criteria	100% Compliance with Client & legal requirements 100% achievement with Site Objectives & targets		Section Manager
Mitigation Measures	General	• Compaction activities that have the potential to impact external stakeholders will consider: • Letter drops to local residents • Static rolling • Oscillating compaction systems • Reduced amplitude settings • Pre & During Construction noise Monitoring • Excessive noise hazard areas will be demarcated and adequately signed, and entry only permitted to these areas when the required PPE is worn • Task rotation may be employed where practicable and when carrying out long tasks	Section Manager
	Training and Competency	As part of the Site Induction, workers will be informed of the site-specific controls required for noise and vibration management including: – Correct use of PPE	
	Hours of Operation	• Construction work in residential areas will only be conducted between the hours of 7 am and 7 pm on days other than Sundays and public holidays • Work outside of these hours will require an after hours approval from the Shire of Serpentine Jarrahdale.	Section Manager

	Plant, Equipment & Vehicles	• Plant will be fitted with appropriate noise emission/vibration control equipment • Plant will be fitted with adequate seat suspension • Plant should be switched off when not in use, wherever practicable • Tasks using equipment that causes vibration to hands will be rotated at intervals to reduce exposure • Consideration may be given to the use of anti-vibration PPE • All plant, equipment and vehicles are to be regularly monitored and maintained and records kept of maintenance • Any abnormalities in expected noise or vibration emissions will be recorded in the plant's logbook and reported to the plant department.	Plant Department
	Monitoring	• Where there is a potential for noise/vibration to effect external stakeholders, the site will consider the use of onsite monitors • Noise / Vibration monitoring will be undertaken in response to complaints.	Project Engineer
Environmental Inspections & Monitoring	Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
	Monitoring	• Where there is a potential for noise/vibration to affect external stakeholders or aspects of the Environment the site will consider the use of onsite monitors.	Project Engineer
Reporting	As a minimum, monthly at site meetings and within the MRWA Monthly Report.		Section Manager

15.9.Appendix 10 – Weed, Pest and Disease Management Sub Plan

Appendix 10 - Weed, Pest and Disease Management Sub Plan			Responsibility
Objectives & Targets	• Refer to the Site Objectives & Targets (section 3 of this EMP)		Section Manager
Performance Criteria	100% Compliance with Client & legal requirements 100% achievement with Site Objectives & Targets		Section Manager
Mitigation Measures	Training and Competency	• As part of the Site Induction, workers will be informed of the Site specific controls required for weed, pest and disease management including: – location of weed infested areas to be avoided; – Identification of weeds and pests & their associated classification. – Pest control operators are to have qualifications.	Section Manager
	Polyphagous Shot Hole Borer (PSHB)	• PSHB is a tree-boring beetle that has a symbiotic relationship with a Fusarium fungus. It cultivates this fungus inside of plants as a food source for themselves and their larvae. • In susceptible trees, the fungus kills the tree by restricting or preventing the movement of water and nutrients within the tree. This causes symptoms such as Fusarium dieback and eventually tree death. The beetle also causes structural damage by creating tunnels, known as galleries, throughout the plant. • The project is located in Zone B which is described as a zone with fewer or no infested trees, acting as a buffer zone, with heightened surveillance to identify and control new infestations. Buffer Zone: Zone B serves as a buffer zone, helping to prevent the spread of the PSHB from areas with high infestations to other parts of Western Australia. Heightened surveillance is in place in Zone B to quickly identify and control any new infestations. • The following controls apply in Zone B: – cannot move untreated or unseasoned wood outside the Quarantine Area, unless chipped to pieces that are 2.5 cm or less in diameter;	Project Engineer

		– cannot move plant materials, including living plants, that are greater than 2cm in diameter outside the Quarantine Area; – must ensure any machinery used to handle wood or plant material is cleaned before it can be moved outside the Quarantine Area; – can move wood, plant materials and living plants, into Zone A and within Zone B. – 	
	Dieback	• High risk items for plant disease (including dieback) including soil, mulch and earth moving equipment are be inspected and declared clean by a competent person before entering Site and records kept.	Project Engineer

	Weed control measures	• Where possible the preferred method of removal for weeds of national significance is by mechanical means where they will then be stockpiled separately from other non-infested topsoil/vegetation, removed from site and destroyed. • In the event that weeds are to be removed by chemical means TEA will contact the relevant local council to engage a qualified pest control operator. Qualifications will be obtained prior to commencing works onsite. • Vehicles and machinery are to be weeded and seeded prior to commencing work. • Vendor declarations to certify that imported topsoils and mulches are weed free.	Project Engineer
	Feral Species/Vermin	• If feral species/vermin are identified within the Site boundary TEA in consultation with the DPIRD may consider and propose measures to the control of feral animal movements. This will be determined on a case-by-case basis.	Supervisor
Environmental Inspections & Monitoring	Monthly/Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings and within the MRWA Monthly Report.		Section Manager
Environmental Inspections & Monitoring	Monthly/Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings		Section Manager

15.10. Appendix 11 – Bushfire Prevention and Management Sub Plan

Appendix 12 - Fire Prevention & Management Sub Plan		Responsibility
Objectives & Targets	• Refer to the Site Objectives & Targets (section 3 of this EMP).	Section Manager
Bushfire context	The site is located in a Bushfire prone 2 area as per the map below. In relation to bushfire risk it should be noted that the full site will be cleared of all isolated trees, and there will only be grassland around the site (minimal threat), with 6 isolated trees within 20m of the site, these 6 trees are also less than 0.25ha in total. Based on this information, it is considered that development of the site office location does not result in a Vulnerable or High-Risk Land Use rating and trigger a Bushfire Management Plan. The preferred Site 1 (Figure 1): P421751 Lot 9002 (1780) Thomas Road (corner of Kargotich Road), Oakford zoned Rural under Local Planning Scheme (LPS) 3 with additional uses A19 (Service Station (P)). 	
Performance Criteria	100% Compliance with Client & legal requirements 100% achievement with Site Objectives & targets	Section Manager

Mitigation Measures	General	• As part of the Site Induction, workers will be informed of the Site-specific controls required for fire management.	Section Manager
	Fire Prevention	• Areas within 3 metres of where dangerous goods are stored will be free from combustible materials.	All
	Monitoring of Prohibited & restricted Burning Times	• The Project will monitor DFES warnings systems website during the life of the project. Total Fire Bans and relevant restrictions in relation to the Project will be communicated at prestart.	Site Engineer
	Fire Management	TEA will not dispose of cigarettes/matches or similar during a prohibited or restricted burning time from a vehicle or in circumstances likely to set fire to the bush. If safe to do so, TEA will extinguish any bush fire within the site boundary and request help from authorities if necessary. Fire breaks will be established as requested by the relevant authorities. Incendiary material (hot/burning ash, furnace refuse or similar) are not authorized to be carried in a vehicle unless it is totally enclosed in a metal container. TEA will also comply with directions of authorities when carrying this material. Such material will only be disposed with approval of authorities.	Section Manager
	Declared Total Fire Ban (TFB)	The following DFES procedure of notification and management is applicable on the Project in the event of a declared TFB; • The HSE Advisor is responsible for checking the DFES website to see if there are any declared TFB's that capture any part of the Project area (www.emergency.wa.gov.au/#totalfirebans;	HSE Advisor

		• Check to see if the fire danger rating has been rated as 'catastrophic' within the Project area. In the event that the fire danger rating has been deemed to be 'catastrophic' then no prescribed activities must occur during the TFB (eg: no hot work) • If conditions are not classed as 'catastrophic' prescribed activities may take place after an online notification has been lodged through the DFES website. Notifications must be issued 24 hours to 30 minutes prior to works. • Where prescribed activities are being done within 3 km of land managed by the Department of Biodiversity Conservation and Attractions (DBCA), then a notification to the DBCA must be issued between 24 hours and 30 minutes prior to the prescribed activities commencing. • Comply with DFES prescribed activities fact sheet/Regulations while undertaking all prescribed activities during a declared TFB. • Hot Works Permits and JHA/SWMS shall include the additional DFES controls outlined within the facts sheets.	
	Bulldozers and graders requirements in restricted or prohibited burning times	Bulldozers or road-graders will not be operated during the prohibited burning times or restricted burning times unless- • a fire extinguisher is carried on the bulldozer or grader • the exhaust pipe is vertical and the exhaust system, including pipes is maintained in a sound and efficient condition • exhaust pipe is fitted with an efficient spark arrester which is of suitable design for the type of bulldozer or road-grader to which it is attached and is maintained in a clean, sound, and efficient condition at all times when the bulldozer or road-grader is in operation during the prohibited burning times or the restricted burning times.	Supervisor
	Welding apparatus & power operated abrasive cutting	• The use of welding and power operated abrasive cutting discs of any kind, in the open air, will be prohibited on site unless at least one fire extinguisher is provided at the place where the welding or cutting operation is carried out; and the work area is surrounded by a firebreak which is at least 5 m wide.	All

	discs requirements in the open air	• These activities will not be permitted during Total Fire Bans.	
Environmental Inspections & Monitoring	Monthly/Weekly (Documented)	To be completed via Beakon forms	HSE Advisor (or delegate)
Reporting	As a minimum, monthly at site meetings and within the MRWA Monthly Report.		Section Manager

15.11. Appendix 12 – Site Options and Environmental Survey of Preferred Site

SITE COMPOUND – TRAFFIC MANAGEMENT PLAN

TONKIN HIGHWAY EXTENSION AND THOMAS ROAD UPGRADE PROJECT

Kargotich Road – Site Office Compound Layout.

Contract Number 179/18

Project Name:	Tonkin Extension Alliance (TEA)
Document Number:	TEA-00-TF-0110-PLN-0003
Client:	Main Roads Western Australia
Revision Date:	04/04/2025
Revision:	A

DETAILS OF [illegible] AMENDMENTS

I David Taylor (AWTM Cert No.STAP-AWTM-23-11544-06) declare that I have designed this Traffic Management Plan following a site inspection on 20/03/2025. The Traffic Management Plan prepared, **subject to the variations approved,** is in accordance with the Main Roads Code of Practice, AGTTM and AS 1742.3

Signature: ..... Date: 04/04/25

	Name / Company	Accreditation Details	Date	Signed
TMP designed by	strada road project consultants	STAP-23-11544-06	04/04/25	
TMP Reviewed by	strada road project consultants	STAP-23-11540-03	04/04/25	
RTM reviewed and Endorsed by	strada road project consultants	RTM #037	04/04/25	
Road Authority Review by				
Road Authority Authorisation	Road authority authorisation of the implementation of traffic signs and devices is given for Traffic Management Plan No. TEA-00-TF-0110-PLN-0003 Signed Authorised Officer Date (Print Name) Position			

TMP No TEA-00-TF-0110-PLN-0003	Rev. No. A	Date 04/04/2025

Revision	Revision Date	Comments	Section / Page No.	Revised By
A	04/04/25	Site Office Compound	N/A	N/A

Terms and Definitions

Term	Definition
The Alliance	Alliance means the Tonkin Extension Alliance (TEA) established for the Project.
Project Traffic Management Plan	The Project Traffic Management Plan refers to the main document that outlines methods and strategies the TEA adopts based on relevant documents and sources, for all works associated with temporarily modifying existing road conditions so construction works may take place. This will cover all items required in a “site specific” Traffic Management Plan as per Main Roads Code of Practice for traffic management either in detail or with methods for addressing in a Traffic Management Plan.
Traffic Management Plan	Traffic Management Plans are detailed plans for implementing specific traffic controls at specific locations and for prescribed times, with additional focus on overlapping activities and impact they may have on each other. They include all items required to be a Traffic Management Plan as per Main Roads Code of Practice and supplement the over.
Traffic Guidance Scheme	Traffic Guidance Scheme is a diagram showing the detailed layout of traffic control devices and is always part of a TMP.
Temporary Road Design	Temporary Road Design is a collection of design documentation that enables a temporary road or access track to be constructed on which traffic management devices can be installed as per the Traffic Guidance Scheme.
Short Term Traffic Management	Temporary traffic management is designed to generally utilise soft (cones or similar) and highly portable traffic management devices. Placed for a defined period usually measured in hours or a well-defined fixed number of days (e.g. off peak lane closure)
Long Term Traffic Management	Temporary traffic management is designed to generally function in a similar manner to permanent works, however built to a lower standard suitable for its intended design life and managed speed environment. This utilises hard (concrete or steel barriers) and partially fixed traffic management devices. Usually intended for a defined period measured in days, weeks or months (e.g. temporary traffic staging).
Vehicle Management Plan	Plan detailing movement of site vehicles from public roads onto site as well as movements within the site.

Glossary

Term	Definition
APT	Alliance Project Team, comprising BMD, Civcon Civil and Project Management, Georgiou Group, BG&E, and GHD and Main Roads WA personnel
AS	Australian Standards
BDC	Basis for Design and Construction
BIM	Building Information Modelling
CCIWA	Chamber of Commerce and Industry, WA
CoA	City of Armadale
CSE	Community and Stakeholder Engagement
C&SEP	Community and Stakeholder Engagement Plan
D&C	Design and Construct
DE	Digital Engineering
DfMA	Design for Manufacturing and Assembly
EMP	Environmental Management Plan
EPA	Environmental Protection Act
HR/IR	Human Resources and Industrial Relations
ISCA	Infrastructure Sustainability Council of Australia
ICNWA	Industry Capability Network, WA
KRA	Key Result Area
LGA	Local Government Authority
Main Roads	Main Roads WA, the Client
MRWA	Main Roads Western Australia, the Client
NOPs	Non-Owner Participants, being, BMD, Civcon Civil and Project Management, Georgiou Group, BG&E, and GHD.
OHS	Occupational Health and Safety
Our Subcontractors	The Tonkin Extension Alliance subcontractors
Our Suppliers	The Tonkin Extension Alliance suppliers

PAA	Project Alliance Agreement, the Contract
PMP	Project Management Plan
Project	The Tonkin Highway Extension Project, the Project
PTA	Public Transport Authority
PTMP	Project Traffic Management Plan
QMS	Quality Management System
RSMP	Railway Safety Management Plan
RFP	Request for Proposal
RNOC	Road Network Operations Centre
S&HMP	Safety and Health Management Plan
SME	Subject Matter Expert
SSJ	Shire of Serpentine-Jarrahdale
SPMT	Self-propelled modular transporters
SWTC	Based on the Main Roads template for Scope of Work and Technical Criteria
TEA	Tonkin Extension Alliance, the Alliance Project Team
TGS	Traffic Guidance Schemes
THE	The Tonkin Highway Extension Project, the Project
TMP	Traffic Management Plan

Contents

1. INTRODUCTION

1.1 Purpose and Scope

This Traffic Management Plan (TMP) outlines the traffic management controls to be implemented by The Tonkin Extension Alliance for the Project site office compound layout.

1.2 Objective and Strategies

The objectives of the Traffic Management Plan is to ensure:

- The safety of the road users accessing the site car park from Kargotich Road.
- The safety of the compound users whilst using the compound.

In an effort to meet these objectives this Traffic Management Plan will incorporate the following strategies:

- Providing a sufficient number of traffic lanes to accommodate vehicle volumes.
- Ensuring delays are minimised.
- Ensuring all road users are managed including motorists, pedestrians, cyclists, people with disabilities and people using public transport.
- Ensuring work activities are carried out sequentially to minimise adverse impacts.
- Provision will be made for works personnel to enter the work area in a safe manner in accordance with safety procedures.
- All entry and exit movements to and from traffic streams must be in accordance with the requirements of safe working practices.

2. PROJECT OVERVIEW

2.1 Location

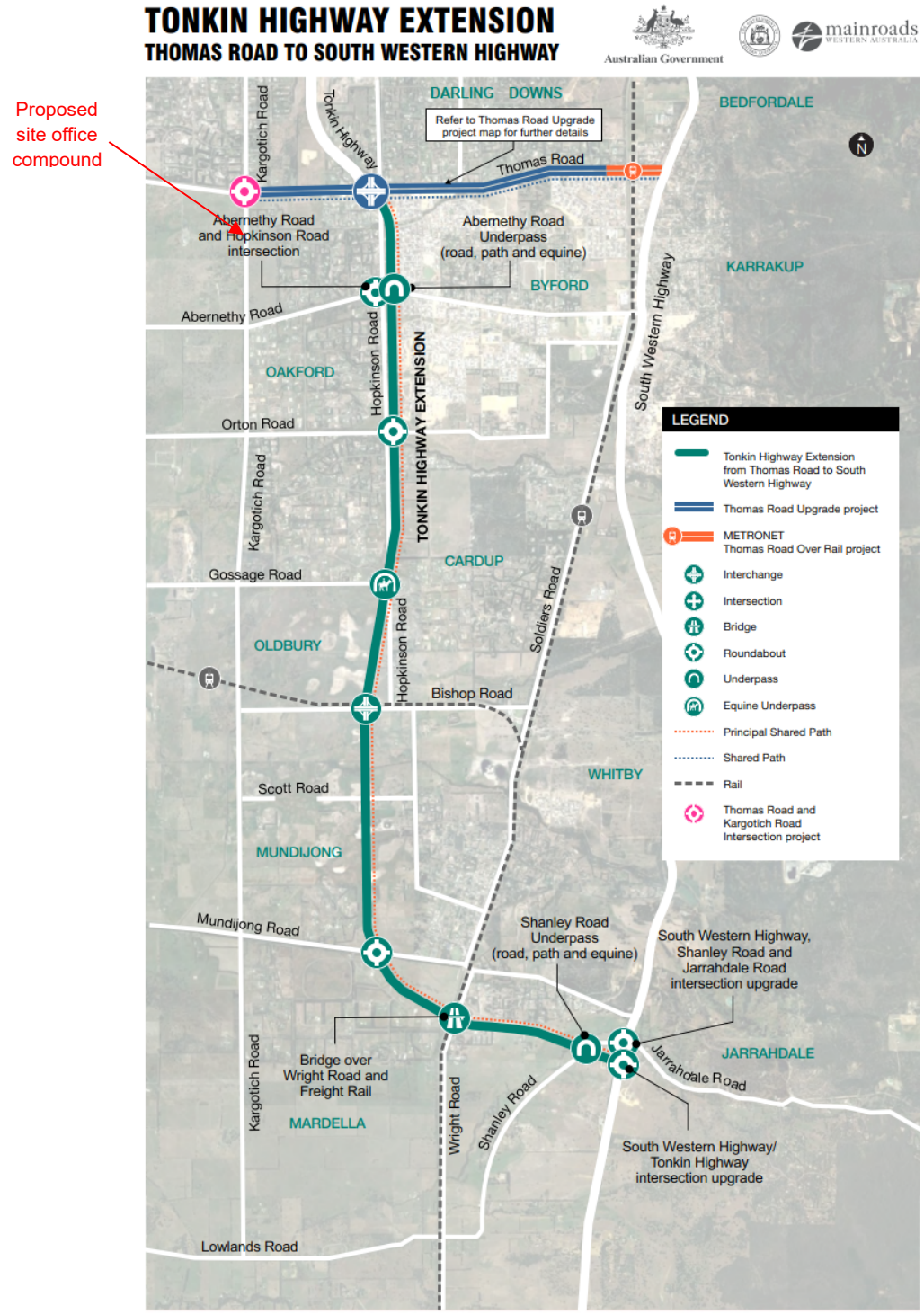


Figure 1A Site Location Sketch

Figure 1B Site Location Sketch

This TMP is applies to the location of the Project Site office located adjacent to the current service station development on Kargotich Road between Brahman Drive and Thomas Road, Oakford, Western Australia.

Figure 2 Site Visit Photo

2.2 Project Details, Site Assessment and Site Constraint /Impacts

ITEM	DESCRIPTION
Project	Tonkin Highway Extension Project – Thomas Road to South Western Highway. Site Office Compound establishment.
Location	Kargotich Road, between Thomas Road and Brahman Drive, Oakford, Western Australia.
Road Classification, Existing Speed Limit	Kargotich Road: Regional distributor, 70km/h – 90km/h
Road Authority	Main Roads WA
Local Government	Shire of Serpentine-Jarrahdale
Principal	Main Roads WA
Prime Contractor	Tonkin Extension Alliance

Sub-Contractor	Georgiou Group, BMD, CivCon Civil and Project Management, BG&E, GHD
Scope of Works	Specific to this TMP as part of the Tonkin Highway Extension Project: The Project site office compound establishment.
Staging of Work / Temporary Traffic Management	This TMP details the long term controls for the Project Site Office compound layout.
Project Date	May 2025 to December 2027
Hours / Days of Work	Monday to Saturday 7am to 7pm. Note: Works may occur outside of the approved work hours pending local government and Main Roads WA approval.
Duration of Work	The site office compound is required for the duration of the Tonkin Highway Extension Project. The site office compound will be removed at the completion of the Project.
Other Constraints	• Traffic volumes on Kargotich Road • Turning movements in close proximity to roundabout • Adjacent service station operations (future) • Noise to local residential properties.
Concurrent/adjacent Works or Projects	• Byford Rail Extension Project • Thomas Road Over Rail Project (Completed – maintenance and defects) • Kargotich Road upgrade & Service Station development (February 2025 to June 2025) - SSJ • Mundijong Road closure (April 2025 to June 2025) – City of Rockingham.
Traffic Volume and Composition	Kargotich Road: • NB daily total 2715 v/d • SB daily total 2893 v/d • Combined daily total 5608 v/d • NB am peak 392 v/h, NB pm peak 193 v/h • SB am peak 168 v/h, SB pm peak 457 v/h • Average percentage heavy vehicles 26.4%
Existing road configuration	Kargotich Road: Single lane each way carriageway
Existing pedestrian / cyclist facilities	Kargotich Road: There is no shared path along Kargotich Road. There is no sealed shoulder along the greater portion of Kargotich Road suitable for cycling.

2.3 Overview of Proposed TTM

ITEM	DESCRIPTION
Temporary Traffic Management Descriptions	This TMP includes traffic arrangements: • Long term modified road layout for site office compound.
Speed zone dates and times	No impacts to the long term speed zones are proposed in this TMP.
Lane Closures dates and times	No lane closures are proposed in this TMP.
Road Closures dates and times	No road closures are proposed in this TMP.
Signal modifications description	No modifications to road signals are proposed in this TMP.
Proposed lane widths	The proposed lane widths for the long term layout maintains 3.5m wide through lanes and proposed turning lanes.
Road Safety Barrier	There are no temporary road safety barriers detailed in this TMP. There are no existing road safety barriers modified as part of this TMP.

2.4 Project Representatives

POSITION	NAME	CONTACT DETAILS
Road Authority Representative	Main Roads WA - Steve Cole (OMTID)	
Local Government	Shire of Serpentine – Jarrahdale - James Carn	Shire of Serpentine – Jarrahdale 6 Paterson Street, Mundijong, WA, 6123 Ph: (08) 9526 1111 Email: jcarn@sjshire.wa.gov.au

Alliance Director (Prime Contractor)	Tonkin Extension Alliance - Peter Hopfmueller	Tonkin Extension Alliance 68 Hassler Road, Osborne Park, WA, 6017 Ph: 0427 003 602 Email: peter.hopfmueller@tonkinalliance.com.au
Construction Director (Prime Contractor)	Tonkin Extension Alliance - Kevin Garry	Tonkin Extension Alliance 68 Hassler Road, Osborne Park, WA, 6017 Ph: 0437 536 835 Email: kevin.garry@tonkinalliance.com.au
Traffic Manager (Prime Contractor)	Tonkin Extension Alliance - Alex Hoyo	Tonkin Extension Alliance 68 Hassler Road, Osborne Park, WA, 6017 Ph: 0498 805 988 Email: alex.hoyo@tonkinalliance.com.au
TMP Design	Strada Consultants - David Taylor	Strada Consultants Suite 10, 2 Hardy Street, South Perth, WA, 6151 Ph: 0439 900 764 Email: david.taylor@strada-rpc.com
TMP Implementation	Refer Tonkin Extension Alliance - Alex Hoyo	

Tonkin Extension Alliance have engaged Strada Consultants Pty Ltd to prepare this Traffic Management Plan and associated controls for the works.

The TMP will be implemented by the Tonkin Extension Alliance traffic management subcontractor (TBA) for TMP implementation provide registration number for state controlled roads

3. RISK MANAGEMENT

The following details the preliminary assessment of site hazards likely to be encountered, the level of risk associated with each and the control proposed. Note that the risk level is the level of assessed risk *without* the controls in place. The controls listed have been determined as being appropriate in reducing the risk to a level that is acceptable.

The hierarchy of control has been utilised to ensure that the highest practicable level of protection and safety is selected:

- Elimination
- Substitution
- Isolation
- Engineering
- Administration
- Personal Protection Equipment

In evaluating the options, a key consideration is whether the option takes traffic around, through or past the worksite.

3.1 Risk Classification Tables

QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT

Level	Consequence	Description
1	Insignificant	Mid-block hourly traffic flow per lane is equal to or less than the allowable lane capacity detailed in AGTTM. No impact to the performance of the network. Affected intersection leg operates at a Level of Service (LoS) of A or B. No property damage.
2	Minor	Mid-block hourly traffic flow per lane is greater than the allowable road capacity and less than 110% of the allowable road capacity as detailed in AGTTM. Minor impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of C. Minor property damage.
3	Moderate	Midblock hourly traffic flow per lane is equal to and greater than 110% and less than 135% of allowable road capacity as detailed in AGTTM. Moderate impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of D. Moderate property damage.
4	Major	Midblock hourly traffic flow per lane is equal to and greater than 135% and less than 170% of allowable road capacity as detailed in AGTTM. Major impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of E. Major property damage.
5	Catastrophic	Midblock hourly traffic flow per lane is equal to and greater than 170% of allowable road capacity as detailed in AGTTM. Unacceptable impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of F. Total property damage.

WHS QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT

Level	Consequence	Description
1	Insignificant	No treatment required
2	Minor	First aid treatment required.

3	Moderate	Medical treatment required or Lost Time Injury
4	Major	Single fatality or major injuries or severe permanent disablement
5	Catastrophic	Multiple fatalities.

QUALITATIVE MEASURES OF LIKELIHOOD

Level	Likelihood	Description
A	Almost certain	The event or hazard: is expected to occur in most circumstances, will probably occur with a frequency in excess of 10 times per year.
B	Likely	The event or hazard: Will probably occur in most circumstances, will probably occur with a frequency of between 1 and 10 times per year.
C	Possible	The event or hazard: might occur at some time, will probably occur with a frequency of 0.1 to 1 times per year (i.e. once in 1 to 10 years).
D	Unlikely	The event or hazard: could occur at some time, will probably occur with a frequency of 0.02 to 0.1 times per year (i.e. once in 10 to 50 years).
E	Rare	The event or hazard: may occur only in exceptional circumstances, will probably occur with a frequency of less than 0.02 times per year (i.e. less than once in 50 years).

IMPORTANT NOTE: The likelihood of an event or hazard occurring must first be assessed over the duration of the activity (i.e. “period of exposure”). For risk assessment purposes the assessed likelihood must then be proportioned for a “period of exposure” of one year.

Example: An activity has a duration of 6 weeks (i.e. “period of exposure” = 6 weeks). The event or hazard being considered is assessed as likely to occur once every 20 times the activity occurs (i.e. likelihood or frequency = 1 event/20 times activity occurs = 0.05 times per activity). Assessed annual likelihood or frequency = 0.05 times per activity x 52 weeks/6 weeks = 0.4 times per year. Assessed likelihood = Possible.

QUALITATIVE RISK ANALYSIS MATRIX – RISK RATING

	CONSEQUENCE				
Likelihood	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost certain (A)	Low 5	High 10	High 15	Very High 20	Very High 25
Likely (B)	Low 4	Medium 8	High 12	Very High 16	Very High 20
Possible (C)	Low 3	Low 6	Medium 9	High 12	High 15
Unlikely (D)	Low 2	Low 4	Low 6	Medium 8	High 10
Rare (E)	Low 1	Low 2	Low 3	Low 4	Medium 7

MANAGEMENT APPROACH FOR RESIDUAL RISK RATING

Residual Risk Rating	Required Treatment
Very High	Unacceptable risk. **HOLD POINT**. Work cannot proceed until risk has been reduced.
High	High priority, WHS MR and Roadworks Traffic Manager (RTM) must review the risk assessment and approve the treatment and endorse the TGS prior to its implementation.
Medium	Medium Risk, standard traffic control and work practices subject to review by accredited AWTM personnel prior to implementation.
Low	Managed in accordance with the approved management procedures and traffic control practices.

3.2 Risk Register

Generic Risks

Item	Risk Event	Consequence	Pre-treatment Risk			Treatment	Residual Risk			TMP/TGS Reference
			L	C	RR		L	C	RR	
1	Traffic flows (speed and volumes) may create a risk of collision with other vehicles on the road, pedestrians, construction vehicles and construction personnel.	Injury to road users and work personnel.	C	4	H12	Temporary speed zones to be implemented approaching and passing the works.	E	3	L3	All TGS
2	Incorrectly designed and / or installed traffic control may result in inadequate protection of the worksite with a subsequent increased potential for crashes and injury.	Potential injury to road users.	C	3	M9	Qualified and experienced personnel have been employed in the preparation of the TMP and associated TGSs and experienced personnel will be used to implement and maintain the traffic control onsite.	E	3	L3	All TGS / TMP cover page declaration
3	Weather conditions may result in a decreased readability of the traffic	Injury to road users.	D	3	L6	The TMP requires that the Contractor undertakes a daily inspection of the traffic	E	3	L3	Section 5.1.1 of TMP

Item	Risk Event	Consequence	Pre-treatment Risk			Treatment	Residual Risk			TMP/TGS Reference
			L	C	RR		L	C	RR	
	control delineation and signage and may increase the potential for crashes.					control and make adjustments as are necessary to ensure effectiveness is maintained. Experienced personnel specialising in the erection and maintenance of traffic control will be used. All signage shall be Class 1 retro-reflective.				

Site Specific Risks

Item	Risk Event	Consequence	Pre-treatment Risk			Treatment	Residual Risk			TMP/TGS Reference
			L	C	RR		L	C	RR	
1	Vertical and Horizontal curves (geometry) limits sight distance to work area and traffic management devices resulting in a collision	Injury to road users. Injury to work personnel	B	4	H12	Prepare TGS following site review. Adjust sign spacing and stopping locations as required to provide increased visibility to the drivers	D	4	M8	TGS & Section 5.1.4 of TMP
2	Vehils collision occurs in the car park due to inattentive drivers	Property damage	C	3	M9	Single direction of flow in car park. Reverse parking to be enforced.	D	3	L6	TGS
3	Side on collision occurs as vehicles exit the site compound onto Kargotich Road	Injury to road users	C	3	M9	Left turn movements only at exit. (New Roundabout to be used to travel south bound on Kargotich Road	D	3	L6	TGS

4. TRAFFIC MANAGEMENT PLANNING AND ASSESSMENT

4.1 Traffic Assessment and Analysis

4.1.1 Traffic and Speed Data

A summary of recent traffic data is provide below:

Location	Vehicles per day (% heavy vehicles)	Date	Source
Kargotich Road	26.4%	2023/2024	Traffic Map

A summary of recent speed data is provided below:

Location	Posted Speed (km/h)	85th Percentile Speed (km/h)	Date	Source
Kargotich Road	70 – 90	NB 99.6 (90) SB 88.2 (90)	2023/2024	Traffic Map

4.1.2 Traffic Flow Analysis

This traffic management plan details the long term control. Depending on the time of day, Kargotich Road is a low to medium volume single lane each way road. The site compound establishment will have a low impact on Kargotich Road as the road currently has a combined peak flow of 650v/h. A single lane will be maintained in each direction on Kargotich Road, with turn pockets installed for right turning traffic in the south bound direction.

4.1.3 Temporary Speed Zones

There is no adjustment to the existing speed zones in this TMP

4.1.4 Existing Traffic signals

There is no impact on traffic signals in this TMP

4.1.5 Impact to adjoining network

There is no notable impact on the adjoining road network in this TMP.

4.1.6 End of Queue Treatment

There is no end of queue treatment required in this TMP.

4.1.7 Portable Traffic Control Devices (PTCDs)

There are no PTCDs required in this TMP

4.1.8 Speed Management

There is no speed management required in this TMP. It is noted that the future roundabout to the north of the proposed site office driveways will induce a natural speed drop on approach to the site office compound due to the geometric nature of roundabout controls.

4.1.9 Excavations or Above Ground Hazards

There are no excavation treatments required in this TMP.

4.2 Road Users

This TMP covers a number of varying rod types with varying existing infrastructure. Some of the varying road users using the road corridors across the Project include:

- Pedestrians
- Cyclists / Electric scooters and bicycles
- Equestrian
- Public Transport
- Motorised vehicles
- Heavy vehicles

4.2.1 Pedestrians

There is no impact on pedestrians in this TMP

4.2.2 Cyclists

There is minimal impact on cyclists in this TMP however it is noted that Kargotich Road future sealed shoulder widening will be used to realign Kargotich Road to create sufficient space for the turning pockets. This may compromise the available space for cyclists locally around the site office driveways, however, it is noted that for the significant majority of Kargotich Road as width the most surrounding roads on the road network, there is generally no sealed shoulder for cyclists to cycle.

4.2.3 Public Transport

The Public Transport Authority network is not impacted by the works in this TMP.

4.2.4 Heavy and Oversized Vehicles

There is no impact on the heavy haulage network as a result of the long term controls detailed in this TMP.

4.2.5 Existing Parking Facilities

There are no existing parking facilities along any of the Projects road network.

4.2.6 Access to Adjoining Properties / Business

Access to all adjoining properties shall be maintained.

4.2.7 Rail Crossings

There are no rail crossings impacted in this TMP.

4.2.8 School Crossings

There are no school crossings that will be impacted in this TMP.

4.2.9 Special Events and Other Works

The Project is long term in nature. The Project Community and Stakeholder Management representatives will liaise with the Shire of Serpentine-Jarrahdale and the City of Armadale local governments regarding local events.

There are no arrangements that have significant or broad spanning impact across the road network. The short term arrangements detailed in this TMP are unlikely to impact any special events.

4.2.10 Emergency Vehicle Access

Emergency vehicles are not anticipated to be impacted by the long term site project office arrangement.

4.3 Night Work Provisions

Where existing street lighting exists, street lighting shall be maintained under this TMP.

Traffic controllers shall ensure all signs and devices are suitable for night time provisions with class 1A reflective material.

Traffic controllers shall wear appropriate Project approved night works garments and vests that meet the requirements of OH&S Australian Standards.

When working at night around residential premises, noise disturbance from machinery and construction activities will likely become a significant inconvenience to residents nearby. Every attempt shall be made to limit the working hours of noisy activities at night or seek alternative methods or devices to achieve the completion of the works. All vehicles working at night shall be fitted with a reversing croaker in lieu of a reversing beeper.

4.4 Road Safety Barriers

There are no temporary road safety barriers detailed in this TMP.

4.5 Shadow Vehicles

Shadow vehicles are not required in this TMP.

4.6 Consultation and Communication / Notification

4.6.1 Other Agencies

The Project Traffic Manager shall conduct regular meetings with the impacted local government authority representatives at the Shire of Serpentine-Jarrahdale, and the City of Armadale. The Project Community and Stakeholder representatives shall also advise of coming works that may impact the relevant LGA's.

4.6.2 Public

The public must be notified of the works and traffic management arrangements which will effect journey times as deemed appropriate by the Project Community and Stakeholder Management Plan. This communication may be done by way of:

- Letter drop to all residents and businesses within the traffic control zone one week ahead of the scheduled works; and,
- VMS boards during the works.
- Social media notifications.

5. SITE ASSESSMENT

5.1 Provision to Address Environmental Conditions

5.1.1 Adverse Weather

Weather is not expected to adversely impact on the effectiveness of the traffic control detailed on the attached TGS's. Notwithstanding this, should adverse weather conditions be encountered during the works, the following contingency plans should be activated. Note: any adjustments to the plan must be risk assessed and approved by someone holding a WTM or AWTM accreditation. Major changes will require road authority approval.

5.1.1.1 Rain

In the event of rain, an on-site assessment must be made and sign spacing and tapers may be extended by 25% to account for increased stopping distances.

If rain occurs, Traffic Management Personnel must inspect the site and where signage and / or devices are not clearly visible, signage may need to be adjusted to improve visibility or if necessary provide additional signage and delineation. Where stopping distances are adversely affected by wet surfaces, spacing between signs may need to be adjusted to provide increased reaction time for drivers. In cases where it is determined that the rain is so heavy that the risk is considered unacceptable, all work must cease until rain has cleared. All changes must be noted in the daily diary.

5.1.1.2 Floods

Should works be affected by flooding to the extent that the worksite becomes impassable or risk is considered unacceptable, all work must cease immediately and Traffic Controllers (and other personnel if necessary) must be deployed immediately to close the site and direct traffic around the flooded area (under the direction of the project manager or traffic manager). Emergency services and the Road Authority must be notified immediately and Traffic Controllers must remain onsite until emergency services and the Road Authority personnel arrive and take control of the site.

5.1.1.3 Other adverse weather (strong winds, thunder storms, etc.)

Should work be required to continue through periods of strong winds, the traffic controllers shall ensure all signs and devices are appropriately weighted and displayed. Should the signs not be able to be maintained, the works are to cease and the traffic management removed.

5.1.2 Sun Glare

Where sun glare is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, sign locations may need to be adjusted and additional delineation and/or traffic control devices provided to address the risk from glare. Additionally, in the event that traffic control is adversely affected by glare at sunset and sunrise, traffic controllers may need to assist in maintaining low traffic speeds.

All changes are to be noted in the daily diary.

5.1.3 Fog, Dust and Smoke

Where fog, dust or smoke is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, sign locations may need to be adjusted and additional delineation and/or traffic control devices provided to address the risk. All changes are to be noted in the daily diary.

Should works be affected by fog, dust or smoke to the extent that risk is considered unacceptable, all work must cease immediately and Traffic Controllers (and other personnel if necessary) must be deployed immediately to close the site.

5.1.4 Road Geometry, Terrain, Vegetation and Structures

This TMP is site wide and covers a variety of road configuration with varying geometry with both horizontal and vertical curves. The northern and central sections of the Project are typically flat in nature with long sweeping curves that offer good lines of sight. At the southern end of the Project, particularly on South West Highway and Jarrahdale Road, there is changing relatively steep vertical grades and rolling curves. The traffic management has been placed that drivers have a good line of sight to the advanced signage with an appropriate drop in speed before the work area.

There are road safety barriers and other similar such obstructions across the Project road network, particularly along Thomas Road. When there are existing obstructions (e.g. barriers), escape routes (or lack thereof) for traffic management workers must be considered. This must be considered when determining signs and device locations and where required a lookout person must utilised.

5.2 Existing Traffic and Adverting Signs

The existing traffic signage shall be maintained unless it directly conflicts with the short term arrangement and is noted to be covered on the plan.

There is no advertisement signage of note on the Project Road network. Should the advertising signage be required to be relocated of removed, the business will be notified by the Project Community and Stakeholder Management representatives.

6. SAFETY PLAN

6.1 Work Health and Safety

All persons and organisations undertaking these works or using the roadwork site have a duty of care under statute and common law to themselves, workers and all site users, lawfully using the site, to take all reasonable measures to prevent accident or injury.

This TMP forms part of the Project Safety Management Plan, and provides details on how all road users considered likely to pass through, past, or around the worksite will be safely and efficiently managed for the full duration of the site occupancy and works.

6.2 Roles and Responsibilities

6.2.1 Responsibilities

The Alliance Director has the ultimate responsibility to ensure the TMP is implemented for the prevention of injury and property damage to employees, contractors, sub-contractors, road users and all members of the public.

The Alliance Director will ensure all site personnel are fully aware of their responsibilities, and that Traffic Controllers are appropriately trained and accredited and that sufficient controllers are available to ensure appropriate breaks are taken.

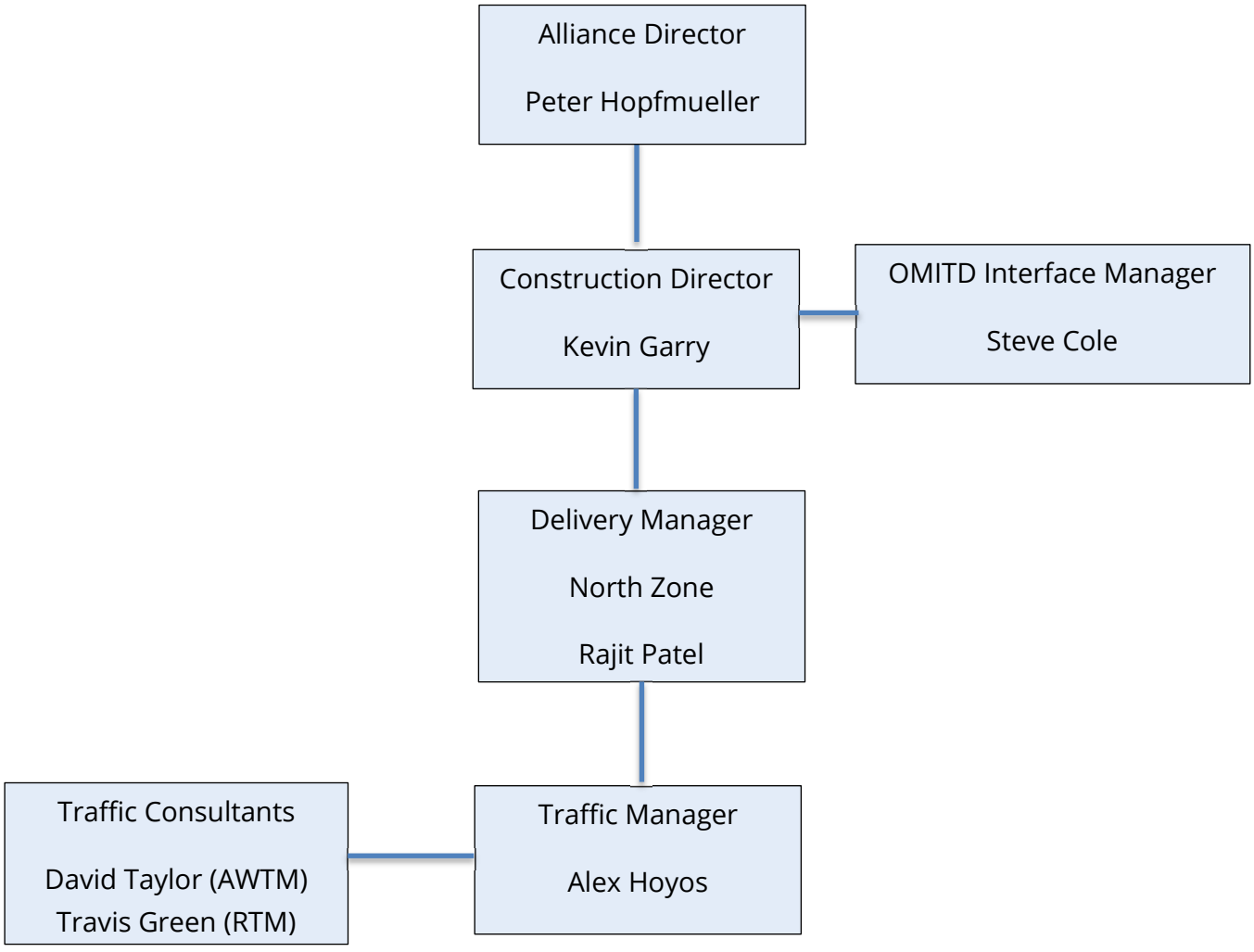
All personnel engaged in the field activities will follow the correct work practices as required by the CoP, AGTTM and AS1742.3.

All personnel will not commence or continue work until all signs, devices and barricades are in place and operational in accordance with the requirements of the TMP.

All personnel responsible for temporary traffic management must ensure that the number, type and location of signs, devices and barricades are to a standard not less than Appendix F of this plan, CoP, AGTTM and AS1742.3 (except where specifically detailed in this TMP with reasons for the variations). Should a situation arise that is not covered by this TMP, CoP, AGTTM or AS1742.3, the Road Authority Representative must be notified.

6.2.2 Roles

The following diagram outlines the responsibility hierarchy of this worksite.



6.2.2.1 Alliance Director

The alliance director must:

- Ensure all traffic control measures of this TMP are placed and maintained in accordance with this plan and the relevant Acts, Codes, Standards and Guidelines

6.2.2.2 Construction Manager

The construction manager must:

- Enure the responsibilities of the alliance director have been managed across the Construction team, including the traffic manager and traffic controllers
- Ensure all traffic control measures of this TMP are placed and maintained in accordance with this plan and the relevant Acts, Codes, Standards and Guidelines
- Ensure suitable communication and consultation with the affected stakeholders is maintained at all times
- Ensure the traffic manager is implementing the traffic plan and the risks are managed accordingly.

6.2.2.3 Site Supervisor

The site supervisor is responsible for overseeing the day-to-day activities, and is therefore responsible for the practical application of the TMP, and must:

- Instruct workers on the relevant safety standards, including the correct wearing of high visibility safety vests
- Ensure traffic control measures are implemented and maintained in accordance with the TMP
- Work with the Traffic Management Supervisor to ensure the correct TGS is selected for the work activity
- Undertake and submit the required inspection and evaluation reports to management
- Render assistance to road users and stakeholders when incidences arising out of the works affect the network performance or the safety of road users and workers
- Take appropriate action to correct unsafe conditions, including any necessary modifications to the TMP.

6.2.2.4 Traffic Manager

The Traffic Manager is responsible for the practical application of the Traffic Management devices and workers in accordance with the appropriate Traffic Guidance Schemes, AGTTM, Main Roads Code of Practice and AS 1742.3.

- Traffic management sites involving 'complex traffic arrangements' on Main Roads controlled roads, must have at least one person with either Worksite Traffic Management or Advanced Worksite Traffic Management accreditation on-site at all times when road workers are present.
- At least one person accredited in Advanced Worksite Traffic Management must be available to attend the site at short notice at all times to manage variations, contingencies and emergencies, and to take overall responsibility for traffic management.

The Traffic Management Supervisor is responsible for the following:

- Work with the Site Supervisor to ensure the correct TGS is selected for the work activity
- Prior to any implementation activities on site the Traffic Management Supervisor must execute all actions outlined in the Austroads Guide to Temporary Traffic Management Part 6, Field Staff – Implementation and Operations.
- Ensuring the Traffic Management devices are set out in accordance with the Traffic Guidance Schemes, AGTTM and Main Roads Code of Practice.
- Ensure that the quality and quantity of Traffic Management devices matches the relevant Traffic Guidance Scheme, Main Roads Code of Practice and AS 1742.3.
- Have all relevant qualifications, including Worksite Traffic Management for complex Traffic Management arrangements on State Roads.
- Must be on site to manage adjustments, modifications, contingencies and emergencies and take overall responsibility for the implemented Traffic Management setups.
- Where changes are required to complex Traffic Management arrangements, the Traffic Management Supervisor must risk assess those changes and record variations in the Daily Diary. Where an RTM is not consulted, all changes must be within the original scope and objectives of the proposed Traffic Guidance Schemes. All other changes must be endorsed by the RTM and must be authorised by the Road Infrastructure Manager.
- Ensure there is a copy of the approved Traffic Management Plan, including all associated Traffic Guidance Schemes is available on site at all times.

6.2.2.5 Traffic Management Workers

- At least one person on site must be accredited in Basic Worksite Traffic Management, and must have the responsibility of ensuring the traffic management devices are set out in accordance with the TMP.

6.2.2.6 Traffic Controllers

Traffic Controllers must be used to control road users to avoid conflict with plant, workers, traffic and pedestrians, and to stop and direct traffic in emergency situations.

Traffic Controllers must:

- Operate in accordance with AGTTM Part 7: Traffic Controllers
- Be accredited in Basic Worksite Traffic Management
- Hold a current Traffic Controller's accreditation
- Be relieved from their duty after not more than 2 hours for a period of rest or "other duties" of at least 15 minutes as required by AGTTM Part 7.

6.2.2.7 Workers and Subcontractors

Workers and Subcontractors must

- Correctly wear high visibility vests, in addition to other protective equipment required (e.g. footwear, eye protection, helmet sun protection etc.), at all times whilst on the worksite
- Comply with the requirements of the TMP and ensure no activity is undertaken that will endanger the safety of other workers or the general public
- Enter and leave the site by approved routes and in accordance with safe work practices

6.3 Personal Protective Equipment (PPE)

All personnel entering the work site must correctly wear high visibility vests to AS/NZS 4602, in addition to other protective equipment required by the Project Safety Management Plan. (e.g. protective footwear, eye protection, helmet, sun protection, respiratory devices, high visibility clothing etc.) at all times whilst on the worksite.

6.4 Plant and Equipment

All plant and equipment at the workplace must meet statutory requirements and have the required registration, licences or certification where required. All mobile equipment must be fitted with suitable reversing alarms. All mobile plant and vehicles must be fitted with a pair of rotating flashing yellow lamps in accordance with AS1742.3 clause 4.14.1. All workers will be made aware of the safe work practice at the time of the site induction.

6.5 Trip Hazards

The worksite and its immediate surroundings must be suitably protected and free of hazards, which could result in tripping by cyclists or pedestrians. Hazards, which cannot be removed, must be suitably protected to prevent injury to road users, including those with sight

impairment. Where level differences are significant, suitable barriers, which preclude pedestrian access must be used.

Where works extend beyond daylight hours and adjacent lighting is insufficient to illuminate hazards to cyclists or pedestrians, appropriate temporary lighting must be installed.

The worksite must be kept tidy to reduce the risk to workers.

7. IMPLEMENTATION

7.1 Traffic Guidance Schemes

The Traffic Guidance Scheme (TGS) outlined in Appendix F and listed below have been provided for the following stages to demonstrate the type of controls that will be implemented throughout the term of the contract. All sign and device requirements are shown on each TGS. Should the use of additional (not shown on the TGS or listing of devices) or reduced number of devices be required due to unforeseen needs, they must be recorded within the Daily Diary as a variation to the TMP, following prior approval.

TGS Number	Revision	Details
TEA-00-TF-0110-DWG-3001	0	Tonkin Highway Extension Project: Generic Short Term: Site Office Compound – Long Term Layout

7.2 Sequence and Staging

The sequence of temporary traffic management installation, work activities and temporary traffic management removal are shown in the table below.

Step	Details
	Single Lane Carriageway Or Low Speed Dual Carriageway
1	Construct Long term site office compound access.
2	Remove site office compound access.
3	Restore existing road to the satisfaction of the Shire of Serpentine – Jarrahdale.

7.3 Traffic Control Devices

7.3.1 Sign Requirements

All signs used must conform to the designs and dimensions as shown in Australian Standard AS 1742.3, AGTTM and the CoP.

Prior to installation, all signs and devices must be checked by the Site Supervisor or a suitably qualified person to ensure that they are in good condition and meet the following requirements:-

- Mechanical condition - Items that are bent, broken or have surface damage must not be used.
- Cleanliness - Items should be free from accumulated dirt, road grime or other contamination.
- Colour of fluorescent 0signs - Fluorescent signs whose colour has faded to a point where they have lost their daylight impact must be replaced.
- Retroreflectivity. - Signs used for night-time or in low light conditions whose retroreflectivity is degraded either from long use or surface damage and does not meet the requirements of AS 1906 must be replaced.
- Battery operated devices - must be checked for lamp operation and battery condition.

Where signs do not conform either to the requirements of AS 1742.3 or would fail to pass any of the above checks, they must be replaced on notice.

Signs and devices must be positioned and erected in accordance with the locations and spacing's shown on the drawings. All signs must be positioned and erected such that:

- They are properly displayed and securely mounted;
- They are within the driver's line of sight;
- They cannot be obscured from view;
- They do not obscure other devices from the driver's line of sight;
- They do not become a possible hazard to workers or vehicles; and
- They do not deflect traffic into an undesirable path.

Signs and devices that are erected before they are required must be covered by a suitable opaque material. The cover must be removed immediately prior to the commencement of work.

Where there is a potential for conflict of information between existing signage and temporary signage erected for the purpose of traffic control, the existing signs must be covered. The material covering the sign must ensure that the sign cannot be seen under all conditions i.e. day, night and wet weather. Care will be taken to ensure existing signs are not damaged by the covering material or by adhesive tape.

7.3.1.1 Securing Signs and Devices

The short term signage shall be weighted appropriately using sand bags or similar devices in windy conditions.

750mm traffic cones may be double stacked to provide additional weight. Similarly, heavier 900mm traffic cones can be used to also provide improved delineation.

7.3.2 Tolerances on positioning of signs and devices

Where a specific distance for the longitudinal positioning of signs or devices with respect to other items or features is stated, for the spacing of delineating devices or for the length of tapers or markings, the following tolerances may be applied: -

(a) Positioning of signs, length of tapers or markings:

(i) Minimum, 10% less than the distances or lengths given.

(ii) Maximum, 25% more than the distances or lengths given.

(b) Spacing of delineating devices:

(i) Maximum, 10% more than the spacing shown.

(ii) No minimum.

These tolerances must not apply where a distance, length or spacing is already stated as a maximum, a minimum or a range.

7.3.3 Flashing Arrow Signs

Where flashing arrow signs are required to better delineate lane tapers, these signs will comprise a matrix of lamps or light emitting elements in the form of an arrow that is flashed in a cyclical manner to provide advance warning. The sign shall have a minimum dimension of 2400mm. x 1200mm. and conform to the requirements of AS/NZS 4192. The Site Traffic Manager shall ensure that all equipment used meets the Australian Standard.

7.3.4 Delineation and Edge Clearance

Temporary frangible or otherwise non-hazardous delineator posts, bollards or cones may be used for edge protection and taper delineation.

Posts or bollards shall be suitable for use as temporary lane separators between through traffic lanes.

Temporary posts or bollards must be capable of being fixed to the road pavement by a suitable road adhesive or by fastening bolts or spikes. Fixing shall be in accordance with manufacturer's recommendations.

Posts and bollards shall be fitted with suitable white retro-reflective tape placed in accordance with AS 1742.3.

All posts or bollards will be inspected daily and where displaced or missing made good as per the temporary maintenance criteria.

If adhesive is used to affix the posts this shall be completely removed from the road surface so that a flush surface is obtained.

All bollards and post type delineators shall be placed at the maximum spacing according to the table below:

Delineator Type	Purpose and Usage	Spacing
Cones, Bollards and Post Type delineators	Edge delineation adjacent to widening and reconstruction	12m
	Merge tapers	9m
	Lateral Shift tapers	12m
	Spacing for all purposes in 40km/h zone	4m

7.4 Site Access for Work Vehicles

Operator of vehicles requiring to drive on site must have a permit to do so as detailed in the Project induction.

Vehicles entering and exiting the traffic stream do so in an environment that is different from normal driving situations, and as such drivers need to be mindful of the conditions that may affect the safety of these movements.

All vehicles movements into and out of site onto existing road networks must be in accordance with the developed TMPs. All entry and exit movements will be in accordance with the Road Traffic Code and shall be undertaken in the following manner:

a) Access points shall be notified to all works personnel and suppliers and clearly designated on Traffic Guidance Schemes

b) As 'following' drivers would not commonly expect 'leading' vehicles to leave the roadway, their attention may be reduced. In recognition of this, drivers travelling along the road way requiring to enter site at a designated site entry location or pull over onto the verge shall:
    - Activate the vehicle's rotating amber lamp
    - Indicate accordingly their intent to turn off the roadway using their indicator
    - Slowly decelerate on approach to the site entry
    - Call up on the nominated (sign posted) UHF channel that they are entering site as to advise personnel and construction vehicles around the site entry location.
    - Proceed to turn into site.
c) Vehicles entering the roadway from the verge or designated site entry location shall:
    - Already have rotating amber lamp on
    - Call up on the nominated (sign posted) UHF channel that they are leaving site as to advise any construction vehicles approaching the site entry location
    - Indicate their direction of travel.
    - Stop at the site exit location prior to entering the roadway
    - Ensure they have a clear line of site to approaching vehicles travelling along the roadway in both directions.
    - When safe to do so, proceed to enter the roadway.
    - Turn rotating amber light off when they have reached the road operating speed.

Gate persons may be used, where required, to assist vehicles entering the traffic stream from the work site. When traffic controllers are used, the contractor shall ensure that all required signage has been installed; traffic controllers follow

7.5 Communicating TMP Requirements

The TMP should be reviewed by the Traffic Manager and the Traffic Management Supervisor prior to the day of implementation. Such that prior planning and preparation of devices required is thorough.

The TMP shall be communicated to all personnel involved in the traffic management and work at prestart.

The traffic controllers shall develop a procedure to communicating using UHF two way communication devices.

8. EMERGENCY ARRANGEMENTS AND CONTINGENCIES

8.1 Traffic Incident Procedures

In the event of an incident or accident, whether or not involving traffic or road users, all work must cease and traffic must be stopped as necessary to avoid further deterioration of the situation. First Aid must be administered as necessary, and medical assistance must be called for if required.

Road plant within the work area that may impact on any services requiring access to a crash site will be cleared from the area quickly as necessary.

8.1.1 Serious Injury or Fatality

In the case of serious injury or fatality occurring within the traffic management site all work must cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) must be deployed immediately to ensure no traffic or other road users approach the area.

An Ambulance and Police must be called on telephone number 000 where life threatening injuries are apparent.

All road workers and traffic management personnel must preserve the scene leaving everything in situ, until direction is given by Police or WorkSafe.

A site specific detour route and/or road closure point will be determined, signed and controlled by traffic management personnel and advised to Police, who will take charge of the site upon arrival. Detour routes will be determined so as to cater for all types of vehicles required to use them. An example of how to manage an emergency can be found in Section 5 of AGTTM Part 10.

All site personnel must be briefed on control procedures covering incidents and crashes that result in serious injury or fatalities.

If it is determined that a road closure point is required on the street of works, a detour route shall be determined prior to the commencement of works by the traffic manager and traffic supervisor.

8.1.2 Minor Incident or Vehicle Break Down within Site

Broken down vehicles and vehicles involved in minor non-injury crashes must be temporarily moved to the verge as soon as possible after details of the crash locations have been gathered and noted. Where necessary to maintain traffic flow, vehicles must be temporarily moved into the closed section of the work area behind the cones, providing there is no risk to vehicles and their occupants or workers. Suitable recovery systems must be used to facilitate prompt removal of broken down or crashed vehicles. Assistance must be rendered to ensure the impact of the incident on the network is minimised.

Any traffic crash resulting in non-life threatening injury must be reported to the WA Police Service on 131 444.

Details of all incidents and accidents must be reported to the Site Supervisor and Project Manager using the incident report form at Appendix “C” (or similar).

8.2 Emergency Services

Emergency services must be notified of the proposed works nature, location, date and times as well as contact details for the site supervisor.

On-site traffic controllers will be equipped with mobile communications to advise and/or liaise with emergency services to ensure a prompt response should the need arise.

8.3 Dangerous Goods

Should any incident arise involving vehicles transporting dangerous goods, all work must cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) must be deployed immediately to ensure no traffic or other road users approach the area.

Emergency services must be notified of the proposed works nature, location, date and times as well as contact details for the site supervisor. All site personnel must be briefed on evacuation and control procedures.

8.4 Damage to Services

In the event that gas services are damaged, all work must cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) must be deployed immediately to ensure no traffic or other road users approach the area. The Police Service and relevant supply authority must be called immediately. Damage to any other services must be treated in a similar manner except machinery may remain operational and access may be maintained where it is safe to do so.

All site personnel must be briefed on evacuation and control procedures.

8.5 Failure of Services

8.5.1 Failure of Traffic Signals

In the event that traffic signal infrastructure near the worksite is damaged or fails to operate correctly, all work must cease immediately and Main Roads WA Road Network Operation Centre (RNOC) must be notified immediately (phone 138 111).

8.5.2 Failure of Street Lighting

In the event that street lighting is damaged and fails to operate or operates incorrectly, Traffic Controllers (and other personnel if necessary with appropriate temporary lighting) must be deployed immediately if the lighting failure adversely affects road user safety to control traffic movements as required. Western Power must be notified immediately.

8.5.3 Failure of Power

In the event that power infrastructure is damaged and poses a risk through live current, Traffic Controllers (and other personnel if necessary) must be deployed immediately to secure the site

and prevent entry to the area affected by live power. Western Power must be notified immediately (phone 13 13 51).

8.6 Emergency Contacts

In the event of an emergency the following relevant authorities must be contacted and advised of the nature of works, location, type of emergency and contact details for the site supervisor.

Emergency Service	E-mail/Website	Phone (Emergency)
WA Police Service	State.Traffic.Intelligence.Planning.&.Co-ordination.Unit@police.wa.gov.au	000
St. John Ambulance	Operations_soc@stjohnwa.com.au	000
DFES	operations.command@dfes.wa.gov.au	000
Power	http://www.westernpower.com.au/customerservice/contactus/	13 13 51
Gas	enquiries@atcogas.com.au	13 13 52
Main Roads	enquires@mainroads.wa.gov.au	138 138
MRWA RNOC	RNOC.Control.Room.Information.Desk@mainroads.wa.gov.au	9323 4848

9. MONITORING AND MEASUREMENT

9.1 Daily Inspections

Prior to works commencing the Site Supervisor must communicate the Traffic Management Plan to all key stakeholders and affected parties.

On completion of setting out the traffic control measures, the site is to be monitored for a suitable period of time. If traffic speeds on the approaches to the work site are assessed as being above the temporary posted speed zone for the work site, the Site Supervisor is to initiate action to modify the approach signage and tapers in accordance with the requirements of AGTTM/CoP. All such actions are to be recorded in the Daily Diary. Should road users be observed to continue to travel in excess of the posted speed limit, the police may be requested to attend the site to enforce the temporary posted speed limit.

The Advanced Worksite Traffic Management accredited supervisory person at the worksite may conditionally approve changes made to a complex traffic management plan subject to review and endorsement of the change by an RTM as soon as practicably possible.

The Traffic Management Contractor must ensure that all temporary signs, devices and controls are maintained at all times. To achieve this, procedures in line with the requirements outlined in AGTTM Part 6 will be instituted. The monitoring program must incorporate inspections:

- Before the start of work activities on site,
- During the hours of work,
- Closing down at the end of the shift period, and
- After hours.

A daily record of the inspections must be kept indicating

- When traffic controls where erected,
- When changes to controls occurred and why the changes were undertaken,
- Any significant incidents or observations associated with the traffic controls and their impacts on road users or adjacent properties.

The Traffic Management Contractor must ensure that personnel are assigned to monitor the traffic control scheme. Inspections must at least satisfy the following requirements.

9.1.1 Before works start

- Confirm TMP and TGS are suitable for the day's activities;
- Inspect all signs and devices to ensure they are undamaged, clean and comply with the requirements depicted on the TGS;
- All lamps should be checked and cleaned as necessary;
- After any adjustments have been made to the signs and devices, conduct a drive through inspection to confirm effectiveness.

9.1.2 During work hours

- Designate and ensure that appropriate work personnel drive through the site periodically to inspect all signs and devices and ensure they are undamaged and comply with the requirements depicted on the Traffic Guidance Schemes;.
- Attend to minor problems as they occur;
- Conduct on the spot maintenance/repairs as required;
- When traffic controllers are on the job, ensure they remain in place at all times. Relieve controllers as necessary to ensure attentiveness is retained;

- During breaks or changes in work activities remove or cover any signs that do not apply (e.g. PREPARE TO STOP, Workers symbolic);
- Re-position signs and devices as required by work processes throughout the day and keep records of any changes.

9.1.3 Closing down each day

- Conduct a pre-close down inspection, allowing time for any appropriate maintenance works;
- Remove any unnecessary signage (e.g. Prepare to Stop, Symbolic Workers);
- Replace any unnecessary signage with appropriate delineation;
- Install barriers and lights where required;
- Drive through site and confirm all signs and devices are operating correctly with no misleading visual cues;
- Record details of inspection and any changes made to layout.

9.1.4 After hours

Not Applicable

9.2 TMP Audits and Inspections

One compliance audit (using the 'Compliance Audit Checklist for Traffic Management for Works on Roads' – found on the MRWA website) must be conducted following setting up of the traffic management and prior to commencement of the works.

Audit findings, recommendations and actions taken must be documented and copies forwarded to the Project Manager and the Road Authority's Representative

9.3 Records

A daily diary recording all inspections including variations to the approved TMP must be kept using the Daily Diary.

The Traffic Supervisor is to record all inspections made on a daily basis and at those times prescribed by the Traffic Management Implementation Standards. Upon completion of each day the Traffic Supervisor must provide copies of the daily diary record to the Project Manager.

The Traffic Supervisor is to record all variations made to the approved Traffic Management Plan on a daily basis and indicate clearly the nature of the variations and the reason for the

variations. Upon completion of each day the Traffic Supervisor must provide copies of the variation record to the Project Manager.

9.4 Public Feedback

All public feedback shall be reported to the Project Community and Stakeholder Manager. Traffic controllers and onsite personnel are not to engage in conversation with the public other than for the purposes of public safety whilst directing around the work site.

10. MANAGEMENT REVIEW AND APPROVALS

10.1 TMP Review and Improvement

A review of the effectiveness of the TMP will be undertaken by the Project Manager and Traffic Management Contractor as part of the close-out procedure

10.2 Variations

Where the TMP needs amending, e.g. due to a change in the scope of works or safety concerns, a modified TMP will be submitted for approval to the Road Authority.

Minor on-site adjustments or modifications, if required, must generally only be made following approval and recorded in the daily diary. In emergency situations, on-site adjustments or modifications must be made and recorded in the daily diary, and the Project Manager notified as soon as practicable.

10.3 Approvals, Authorisations and Permits

Before works commence it is necessary to seek approval from the following:

- Main Roads WA (Road Planned Interventions, HVS, etc);
- Shire of Serpentine – Jarrahdale.

APPENDIX A – NOTIFICATION OF ROADWORKS

Note: When required, a Notification of Roadworks form shall be issued by the Project Traffic Manager.

APPENDIX B – VARIATION TO STANDARDS

APPLICATION FOR APPROVAL TO VARY REQUIREMENTS OF AUSTRALIAN STANDARDS AS1742.3 OR MRWA TRAFFIC MANAGEMENT CODES OF PRACTICE

Form Instruction

1. **Section A** – Identify the Principal Agency / person commissioning the activity. (Does not include contractors, subcontractors or **traffic** management company/traffic planners etc).
2. **Section B** – Identify activity location, start / finish date and time, type of traffic management, description location of activity.
3. **Section C** – Identify the person that has prepared the Traffic Management Plan, this person shall have AWTM accreditation.
4. **Section D** – For Works undertaken on a State road or on behalf of Main Roads Western Australia the details of the risk assessment process identified in this application form must be documented and endorsed[1] by an accredited Roadworks Traffic Manager.

   All applications to be addressed to the applicable Main Roads Regional office. For contact information please refer to the online Application kits and guidelines to undertake works. (www.mainroads.wa.gov.au >Our Roads > Conducting Works on Roads).

   For all other applications the details of the risk assessment process identified in this application form must be documented and endorsed[1] by the person responsible for approving the traffic management plan.

   Contact with the appropriate road authority should be made prior to lodgement of this application to determine its suitability and for any additional requirements.
5. **Section E** - Risk implication, identification and assessment process must be undertaken in accordance with Risk Management – Principles and Guidelines AS/NZS ISO 31000. The likelihood and consequences should be rated after the application of any additional counter measures taken utilising Tables from Annexure's 202B and 203B, Main Roads WA - Specification 202 and 203 respectively.

   Incomplete or applications not signed by the RTM[1] will not be processed.

	Applicant (Principal for the Works)	Tonkin Extension Alliance
	Postal address	68 Hassler Road

[1] A person with AWTM accreditation is permitted to endorse a variation of less than 135 % of the allowable lane capacity as outlined in table 4.10 of AS 1742.3. See section 5.6 of the Code of Practice

SITE OFFICE COMPUND - TRAFFIC MANAGEMENT PLAN

Tonkin Extension Alliance

A	Suburb	Osbourne Park	State	WA	Postcode	6017
	Project Manager	Peter Hopfmueller			Telephone	0427 003 602
	Email	Peter.hopfmueller@tonkinalliance.com.au			Facsimile	

B	Anticipated start date				Anticipated finish date	
	Daily work Fro		To		Weekend work	Yes ☒ Sat ☐ No ☐
	Location of works (Road/Street Suburb),					
	Road type (eg undivided, two					
	Description of works					
	Are alterations to permanent traffic signals	Yes ☒	No ☐	N/A ☐		
	Posted Speed	Varies	Worksite speed	Varies	After hours speed	Existing

C	TMP Designer	Strada Consultants				
	Accreditation Number					
	Postal address					
	Suburb		State		Postcode	
	Email		Telephone		Facsimile	
	Endorsement signature					

D	RTM Endorsing Variation[1]	
	Accreditation Number	
	Postal address	

SITE OFFICE COMPUND - TRAFFIC MANAGEMENT PLAN

	Suburb		State		Postcode	
	Email		Telephone		Facsimile	
	Endorsement signature[1]					

For Internal Use Only							
Approving Road Authority							
Approving Officer Position							
Application	Yes ☐ No	If Not Why					
Additional Conditions							
Approved By:		Title		Date		File	

EARLY WORKS - TRAFFIC MANAGEMENT PLAN

E	Description of Variation Requested	Specify Point of Departure from Standard / Code of Practice (List section and page number)	Justification (Why is this necessary)	Additional Counter Measures To Be Taken (Identify additional counter measures to be used to negate the lesser treatment)	Residual Risk[2]		
					L	C	RR

[2] Note: the risk assessment in the TMP also needs to record the variation and include the risk event, pre-treatment risk, treatment and residual risk.

APPENDIX C – RECORD FORMS

Tonkin Extension Alliance

EARLY WORKS - TRAFFIC MANAGEMENT PLAN

Daily Diary
Daily Traffic Management Diary

Location: _____ Client: _____ Date: _____

TMP No: _____ TGS No: _____ Weather Conditions: _____ Diary Sheet: _____ of _____

Start Time at Depot: _____ Time Arrive Onsite: _____ Commencement of Site Setup: _____ Site Setup and Operational: _____

Site Pulled Down at: _____ Time Aftercare signs setup: _____ TGS No: _____ Time left site: _____ Finish time at Depot: _____

☐ Day Works ☐ Night Works ☐ Emergency Response Site Setup as per TGS ☐ Yes ☐ No (if not comment on next page)

☐ Attendance at Pre-Start Meeting Did an incident occur (if yes complete incident report form) ☐ Yes ☐ No

I confirm that the above times of 'setup' and 'pulldown' of traffic management signs and devices are a true and correct

Name (Site Supervisor): _____ Signed: _____

Drive Through Checks (Checks must be conducted at least every 2 hours)

Time of check entered. Rule off and leave blank if the check does not apply to the site. Make a note of any issues on the next page.

Traffic Management Site Checks	1	2	3	4	5	6	7	8	9	10
Time										
Are signs upright, clean, visible, level & stable										
Are taper lengths correct										
Are speed limit signs correct and doubled up										
Are sign spacings correct										
Are cone/bollard alignments straight & spaced correctly										
Are devices operating correctly										
Have pedestrians been catered for										
Are lane widths adequate										

EARLY WORKS - TRAFFIC MANAGEMENT PLAN

Are vehicle queue lengths acceptable										
Is road surface condition adequate										

No. of Traffic Management Vehicles Onsite: _____ No. of Traffic Management Personnel Onsite: _____

Traffic Management Personnel Names & Accreditations:

Position	Name	Accreditation Details	Time of Break from Stop/Slow (Traffic controllers must have a 15 minute break every two hours of constant stop/slow operation)							
			On	Off	On	Off	On	Off	On	Off
Crew Leader:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:

Additional Comments _____

I confirm that the details contained herein are true and correct

Name: (Traffic Management Crew Leader): _____ Signed: _____

APPENDIX D – TRAFFIC ANALYSIS AND VOLUME COUNTS

mainroads WESTERN AUSTRALIA

SITE 51194

Hourly Volume

Kargotich Rd (1080009)

South of Orton Rd (SLK 7.30)

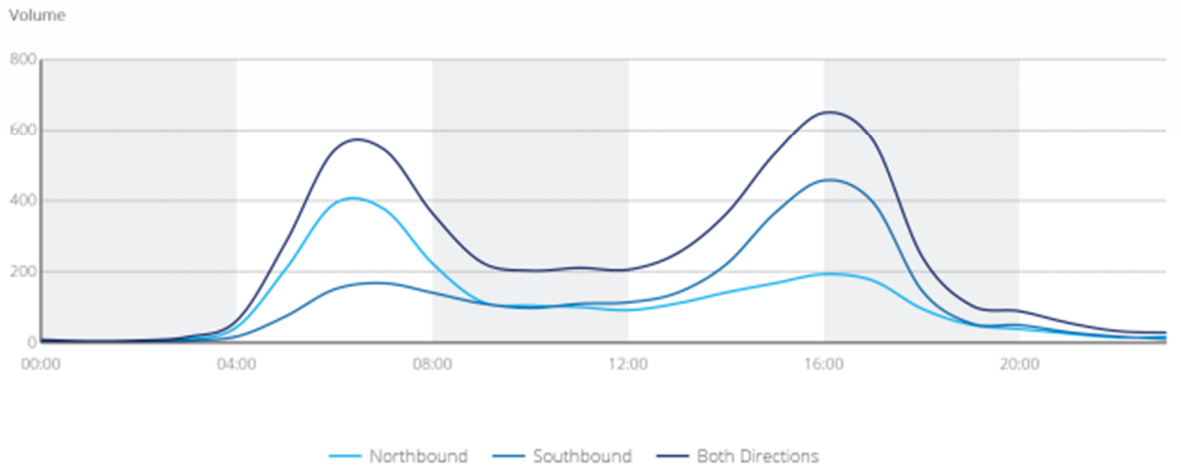
2023/24

Monday to Friday

	All Vehicles			Heavy Vehicles			
	NB	SB	Both	NB	SB	Both	%
00:00	3	6	9	0	1	1	11.1
01:00	3	2	5	0	0	0	0.0
02:00	6	1	7	2	0	2	28.6
03:00	10	7	17	4	4	8	47.1
04:00	45	18	63	12	6	18	28.6
05:00	208	75	283	67	18	85	30.0
06:00	392	151	543	104	36	140	25.8
07:00	377	168	545	87	43	130	23.9
08:00	223	141	364	57	37	94	25.8
09:00	116	111	227	39	33	72	31.7
10:00	105	98	203	33	35	68	33.5
11:00	101	110	211	36	39	75	35.5
12:00	92	114	206	36	43	79	38.3
13:00	111	141	252	40	47	87	34.5
14:00	142	221	363	37	61	98	27.0
15:00	168	366	534	49	94	143	26.8
16:00	193	457	650	52	107	159	24.5
17:00	175	395	570	36	75	111	19.5
18:00	96	147	243	19	32	51	21.0
19:00	51	55	106	12	12	24	22.6
20:00	39	50	89	11	9	20	22.5
21:00	26	30	56	5	4	9	16.1
22:00	15	18	33	2	4	6	18.2
23:00	18	11	29	2	1	3	10.3
TOTAL	2715	2893	5608	742	741	1483	26.4

Peak Statistics

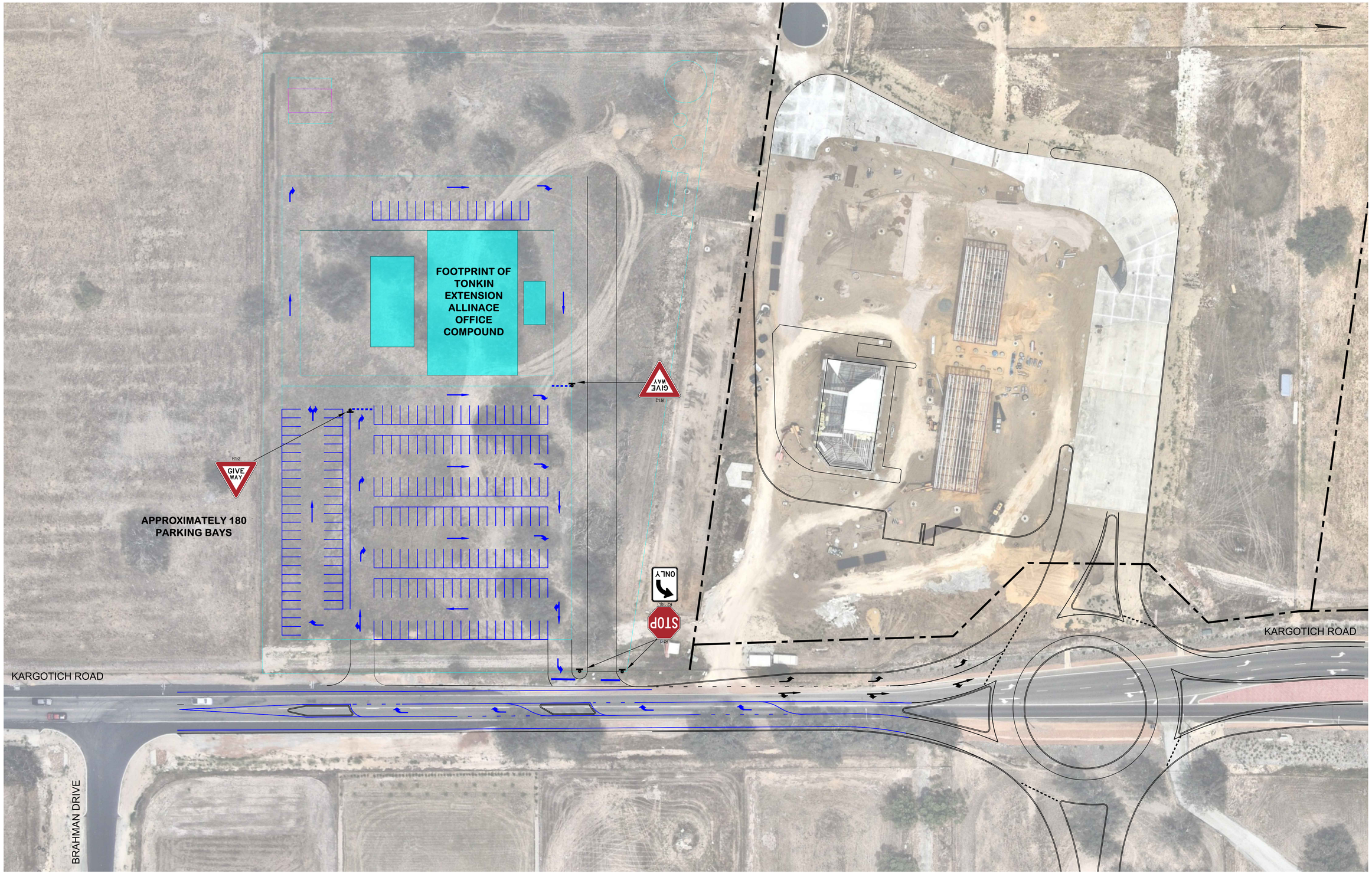
AM	TIME	06:00	07:15	07:00	05:45	06:30	06:15
	VOL	392	173	545	110	44	148
PM	TIME	15:45	16:15	16:15	16:00	16:00	16:00
	VOL	200	471	665	52	107	159



APPENDIX E – ROADWAY ACCESS AUTHORISATION PERMIT

Approval from SSJ and MRWA to be included in this appendix

APPENDIX F – TRAFFIC GUIDANCE SCHEMES & SIGNAGE STRATEGY



Rev.	DATE	DESCRIPTION	APPROVED
0	04.04.25	ISSUED FOR STAKEHOLDER REVIEW	TG

METADATA

GROUND SURVEY STANDARD:

DATE OF CAPTURE:

MAPPING SURVEY STANDARD:

DATE OF CAPTURE:

MAIN ROADS PROJECT ZONE:

HEIGHT DATUM:

Tonkin Extension Alliance

strada road project consultants

DESIGNED	D. SCHMIDT STAP-AWTM-23-11540-03	04.04.25	
DRAWN	D. SCHMIDT STAP-AWTM-23-11540-03	04.04.25	
REVISED			
REVIEWED & ENDORSED	T.GREEN RTM037	04.04.25	

DRAWING TITLE

TONKIN EXTENSION ALLIANCE
SITE OFFICE COMPOUND LAYOUT
LONG-TERM AFTERCARE ARRANGMENT
TRAFFIC MANAGEMENT LAYOUT

SHEET: A1

SHEET No.: SHEET 1 OF 1

LOCAL AUTHORITY: SHIRE OF SERPENTINE/JARRAHDALE

MAIN ROADS RESPONSIBILITY AREA: -

DRAWING STATUS: -

DRAWING NUMBER: TEA-00-TF-0110-DWG-3001

REV: 0

SCALE: 1:500@A1

Document No.:	TEA-ENV-APP-01		
Discipline / Document Title:	Site Options and Site Assessment of Preferred Site - Temporary Site Office Kargotich Road		
Prepared By:	Tonkin Extension Alliance		
Revision:	B	**Date:**	24/03/2025

1 Introduction

The construction of the Tonkin Extension Alliance from Thomas Road to South West Highway project requires a temporary site office to accommodate staff and contractors (approximately 120) and car parking for up to 200. The approvals are required as soon as possible to allow for a May earthworks commencement. This document provides the options assessment, an approvals summary to establish the temporary works. Considerations include:

- Environment and sustainability – minimising clearing, access to groundwater and power
- Location and proximity to construction works
- Safety and access (highway and ingress/egress and fire)
- Land use and access agreements and end land use

Fiver options were considered are summarised below:

1. Kargotich Road, Oakford – considered safe access, agricultural pursuits, adjacent service station, some remnant trees which may cause delays from an environmental perspective if clearing cannot be avoided.
2. Abernethy/Kargotich Road, Oakford (south of Abernethy) -
3. Thomas Road/Kargotich Road intersection – agricultural landuse, cleared site, safety and traffic movements considered as safety risk.
4. Thomas Road East of Kargotich Road and West of Tonkin Highway – cleared site, unable to reach landowner agreement on appropriate terms.

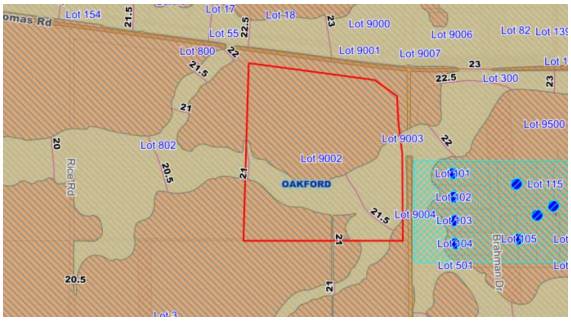
5. Corner Thomas and Biggs Road – cleared site, existing earthworks and extractive industry (and associated risks), site access and site size restrictions.

Of the five options there were two preferred options, and both are located on Kargotich Road, Oakford (refer Figure 1) Oakford is an outer suburb of Perth, Western Australia, within the Shire of Serpentine-Jarrahdale. There is a potential that the hard stand area could be reused, which is a preferred option from a sustainability perspective. This would require the necessary approvals at the time.

1.1 Preferred Options: Lot Details and Access

There were two preferred sites, of which site 1 has been chosen to progress the approvals due to the accessibility and the lease agreement terms are acceptable for the period of construction. Both sites are located in a Bushfire prone area and a Moderate risk of ASS.

Site 1 (Figure 1): P421751 Lot 9002 (1780) Thomas Road (corner of Kargotich Road), Oakford zoned Rural under Local Planning Scheme (LPS) 3 with additional uses A19 (Service Station (P)). The site is 15.054 ha and located in the Shire of Serpentine Jarrahdale.



Site 2 (Figure 2): Lot 218 (575) Abernethy Road Oakford (corner of Kargotich Road), Oakford zoned Rural under Local Planning Scheme (LPS) 3.

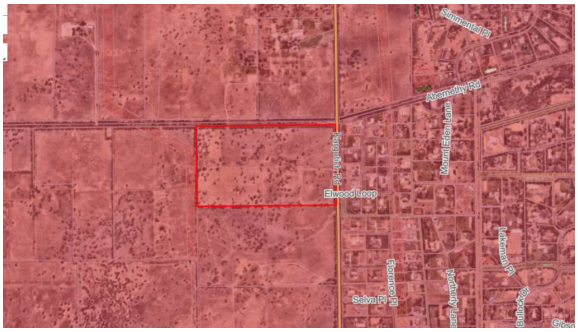


Figure 1 - Left: Corner of Thomas Road and Kargotich Road Oakford, and Right: Corner of Kargotich and Abernethy Road Oakford (source: https://maps.sjshire.wa.gov.au/)

Figure 2 - Kargotich Road Oakford Preferred and Proposed Site Office

2 Approvals

2.1 Clearing

It is an offence to clear native vegetation without a permit or approval. Main Roads has a state wide clearing permit (CPS818/16) that streamlines clearing approvals, however is not always appropriate for use, for example on freehold land. As such this permit will only be used with permission from the Main Roads Environment Manager, and on this occasion it has not been granted.

Preferred Site 1 contains isolated native species (*Casuarina obesa*) that will need to be cleared to accommodate the temporary works. The clearing area is less than 1 hectare, and the site is classified as completely degraded as it is a paddock used for grazing and there is no middle or understory intact.

As the area is outside of the EP Act approval, a separate approval for native vegetation clearing would normally be required, and a clearing permit application made under Part 5 of the *Environmental Protection Act 1986*. The application would include:

- Completed application form
- Description of proposed clearing – a site visit with a tree species listing will be required at minimum. In most instances a flora assessment is required by a suitably qualified botanist.
- Landowner permission

Once DWER receive the application, the application is advertised to the public for comment. These comments are considered by DWER during their assessment process. Timing is provided in Table 1 and Appendix 1. As the site is being used for a building, under the Clearing Regulation 5, Item 1, exemptions apply for clearing <5 ha for the construction of a building and for the clearing of isolated trees. Preferred Site 2 contains vegetation that may be able to be avoided.

2.2 Development Application – Local Planning Scheme

Development within the Shire is guided by the *Planning and Development Act 2005* and the Shire of Serpentine Jarrahdale Local Planning Scheme. The Shire has also developed a number of supporting policies to encourage orderly and proper planning within the unique character of the Shire.

Planning approvals in Serpentine Jarrahdale include variations to the Town Planning Scheme or development outside of an approved the Building Envelope. Where accommodation works are proposed an approval will be required under the local planning scheme. Where development approval is sought under the local planning scheme, the application is determined by the local government. Timing is provided in Table 1.

2.3 Site Offices – Approvals

Sewage

On-site disposal of wastewater is required in areas where reticulated sewerage is not available. An application must be lodged to construct and install an apparatus for on-site wastewater disposal under the *Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974 .*

The form to lodge an Application to Construct or Install an Apparatus for the Treatment of Sewage (https://www.health.wa.gov.au/Articles/A_E/Apply-to-install-a-wastewater-system) in accordance with the Department of Health (DOH), Environmental Health Directorate is available on the website:

1. If it is intended that the proposed apparatus will handle less than 540L/day of wastewater OR the building to be serviced is a single dwelling, the local government will process your application.

2. If the wastewater volume generated is more than 540L/day AND the building being serviced is not a single dwelling the local government will assesses your application, prepare a local government report and forward the application to Department of Health (DOH), Environmental Health Directorate for approval. Refer to the Guidance on applying for approval of installation of a commercial onsite wastewater system to support the submission of your application.

Water and Fire Fighting Water

Where a lot is not connected to reticulated water, dwellings shall be provided with an adequate supply of potable water from either an underground bore, a rainwater storage system or an alternative system as approved by the local government, with a minimum capacity of 120,000 litres and an appropriate roof catchment where relevant in addition to an adequate supply of water for fire fighting purposes as required by State Planning Policy 3.7—Planning in Bushfire Prone Areas.

Stormwater and Drainage

Flood protection, measures for future development, erosion control internally and to adjacent road reserves, surface water management and nomination of proposed drainage easements shall be considered.

Table 1 - Approvals Timing

Clearing Permit	There is no statutory timeframe for the assessment, however DWER aims to undertake the assessments within 60 business days. Once DWER grant permission to clear, this is advertised again for any public appeals. Clearing is not permitted to commence until after the appeal period has concluded (approximately 4 weeks).
Development Application (DA)	Shire of Serpentine-Jarrahdale. DA's are to be determined within 60 days (verbally stating 90 days as this includes 1 month for advertising) in accordance with the *Planning and Development (Local Planning Scheme) Regulations 2015 (the Regulations)*, otherwise it is deemed to have been refused (Schedule 2, part 9, clause 75(2) of the Regulations) and a right of appeal is activated. It is noted that third parties do not have a right of appeal in relation to development applications.
Site Offices	*Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974* On-site disposal of wastewater is required in areas where reticulated sewerage is not available. An application must be lodged every time you intend to construct and install an apparatus for on-site wastewater disposal via the Local Government Environmental Health Services and the Department of Health (DOH), Environmental Health Directorate. Loading rates are located here: Supplement to Regulation 29 and Schedule 9 - Wastewater system loading rates**.** It can take up to 25 business days from the date of lodgement to determine an uncertified application and issue a permit. During the assessment period, if the Shire determines that further information is required the applicant will be contacted and requested to provide the outstanding information. Building permits will be required.

Attachment 1

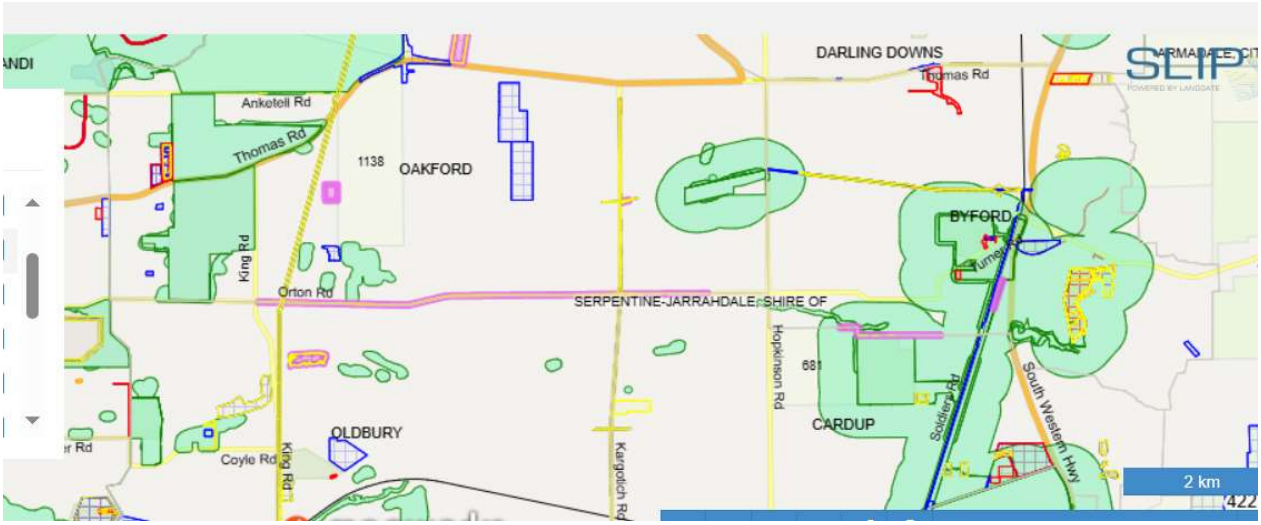
Clearing Permit Considerations

Lot 9002 (1780) Thomas Road (corner of Kargotich Road), Oakford

As the site is being used for a building, under the Clearing Regulation 5, Item 1, exemptions apply for clearing <5 ha for the construction of a building and for the clearing of isolated trees. The clearing referral process allows prospective referrers to refer their proposed native vegetation clearing to the Department of Water and Environmental Regulation (DWER) (or the Department of Mines, Industry Regulation and Safety (DMIRS)) to determine whether a clearing permit is needed. The TEA has decided to send the site office works area to the Department of Water and Environmental Regulation for a referral determination under section 51DA(3) of the Environmental Protection Act 1986 (the EP Act) with the aim that a clearing permit is not required for the proposed clearing of the area(s). TEA believes the reason that this referral could be a positive determination is that the proposed clearing satisfies all of the criteria specified in section 51DA(4) of the EP Act as described in the table below:

Section 51DA(4) of the EP Act	**Tonkin extension Aliance Response**
(4) In making a decision under subsection (3) the CEO must have regard to — (a) whether the area proposed to be cleared (the ***area***) is small relative to the total remaining vegetation — (i) within the region in which the area is situated; or (ii) of the ecological community of which the vegetation proposed to be cleared forms part; and (b) whether there are any known or likely significant environmental values within the area; and (c) whether the state of scientific knowledge about vegetation within the region in which the area is situated is adequate; and	Only those trees required for the site office building and access will be cleared. The area to be cleared is less than 5.0 hectares and the site is not classified as an environmentally sensitive area. Under the Clearing Regulation 5, Item 1, exemptions apply for clearing <5 ha for the construction of a building and for the clearing of isolated trees. The site contains isolated *Casuarina obesa,* commonly known as swamp sheoak trees and the site is degraded (pasture grass/no understorey) The tree canopy totals 0.2392 ha (2,392m^2). Conservation Code: Not threatened Naturalised Status: Native to Western Australia

(d) whether the issues that would arise as a result of the proposed clearing are likely to require conditions to manage or mitigate effects on the environment.	These works are adjacent the Tonkin Highway Extension Project (which is subject to EPBC and EPA approval). The clearing works will be managed under the Construction Environmental Management Plan which has been developed for the adjacent project. Other approvals with conditions are the DA and building permit.

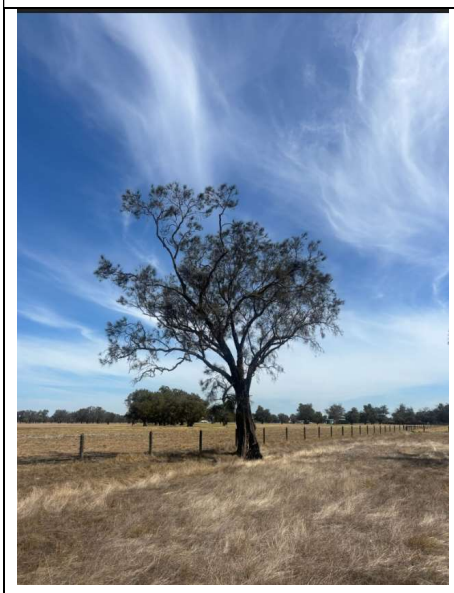


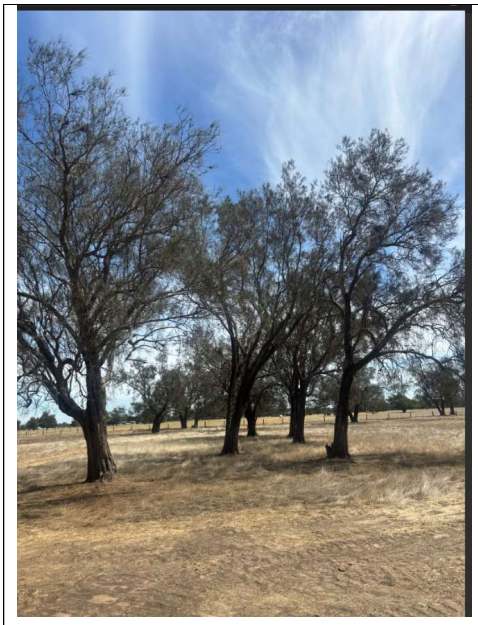
Under the Clearing Regulation 5, Item 1, exemptions apply for clearing <5 ha for the construction of a building and for the clearing of isolated trees. The prior consent of the landowner will be required. The trees are isolated and the site is degraded (pasture grass/no understorey) tree canopy totals 2,392m^2.

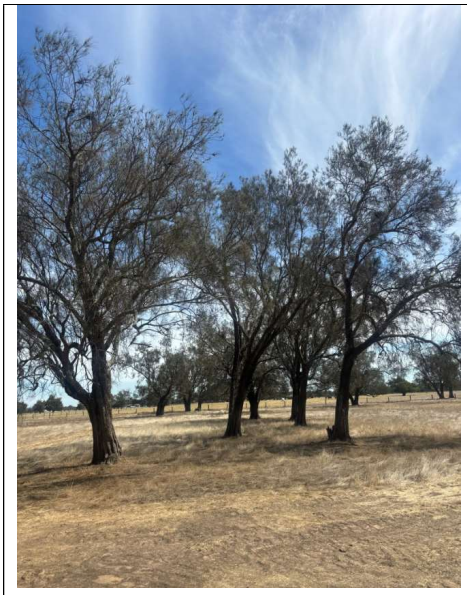
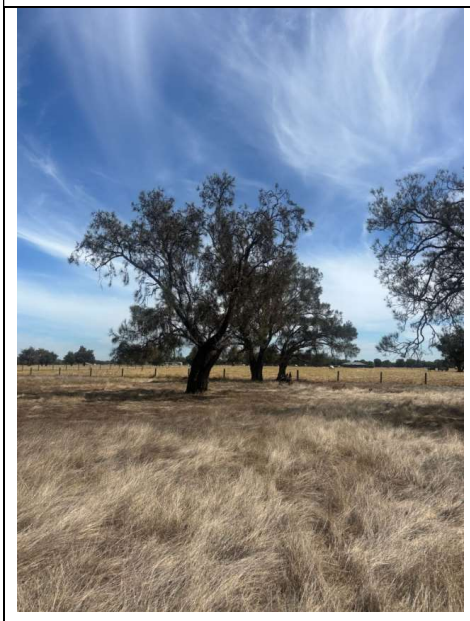
Item no.	Wording of exemption	Comment / explanation
Regulation 5, Item 1 Clearing to construct a building Clearing must be done by or with the prior authority of: The owner of the property on which the clearing is to take place.	Clearing of a site for the lawful construction of a building or other structure on a property, being clearing which does not, together with all other limited clearing on the property in the financial year in which the clearing takes place, exceed five hectares, if – (a) the clearing is to the extent necessary; and (b) the vegetation is not riparian vegetation.	Clearing of native vegetation for the lawful construction of a building or other structure is exempt as long as other relevant approvals have been obtained, including any planning approvals and building licence. "Building" means a roofed building or other roofed structure that is permanently fixed to the ground, and includes a transportable building that is: (a) connected to a sewerage system or septic tank; or (b) intended to be used as a permanent building. Clearing may also be carried out for the construction of other structures. Clearing must only be to the extent necessary for the building or other structure. For example, this exemption does not allow you to clear a large area to simply install a 2m x 3m garden shed. This exemption does not allow clearing of riparian vegetation. "Riparian vegetation" means the distinctive vegetation associated with a wetland or watercourse. "Property" means an area of land that is managed as a single property whether or not it is made up of a number of properties held under separate titles.

Item no.	Wording of exemption	Comment / explanation
		Under this item you should note that clearing for a building, combined with other exempt clearing activities on the property, must not exceed five hectares in a financial year. This means that if you clear for any of the following purposes, the clearing may not add up to more than five hectares in a financial year. • Clearing to construct a building (Item 1) • Clearing to collect firewood (Item 5) • Clearing to obtain fencing or farming materials (Item 6) • Clearing for woodwork (Item 7) • Clearing for fence lines (Item 10) • Clearing for vehicular tracks (Item 12) • Clearing for walking tracks (Item 13) • Clearing isolated trees (Item 19) This exemption does not apply in an environmentally sensitive area.
Regulation 5, Item 2 Clearing resulting from accidents	Clearing – (a) for the purposes of preventing imminent	In regard to clearing under this exemption: (a) The danger or risk to the environment must be present

Casuarina obesa commonly known as swamp sheoak – Tree location 1 outside of clearing area

	*Casuarina obesa* – Tree location 2 – Near death.
	*Casuarina obesa* – Tree location 3

	*Casuarina obesa* – Tree location 4
	*Casuarina obesa* – Tree location 5 IMG_20250318_154705.jpg

	*Casuarina obesa* – Tree location 6 IMG_20250318_154753.jpg
	*Casuarina obesa* – Tree location 7

	*Casuarina obesa* – Tree location 8
	*Casuarina obesa* – Tree location 9

	*Casuarina obesa* – Tree location 10
	*Casuarina obesa* – Tree location 11 IMG_20250318_154738.jpg

	*Casuarina obesa* – Tree location 12 IMG_20250318_154753.jpg
	*Casuarina obesa* – Tree location 13

	*Casuarina obesa* – Tree location 14 IMG_20250318_154753.jpg