SECTION 14 - CLEARANCES

VERSION 2.0

SECTION 14 – CLEARANCES

(For details of Clearances Requirements for Service Conductors, refer Section 1.7.)

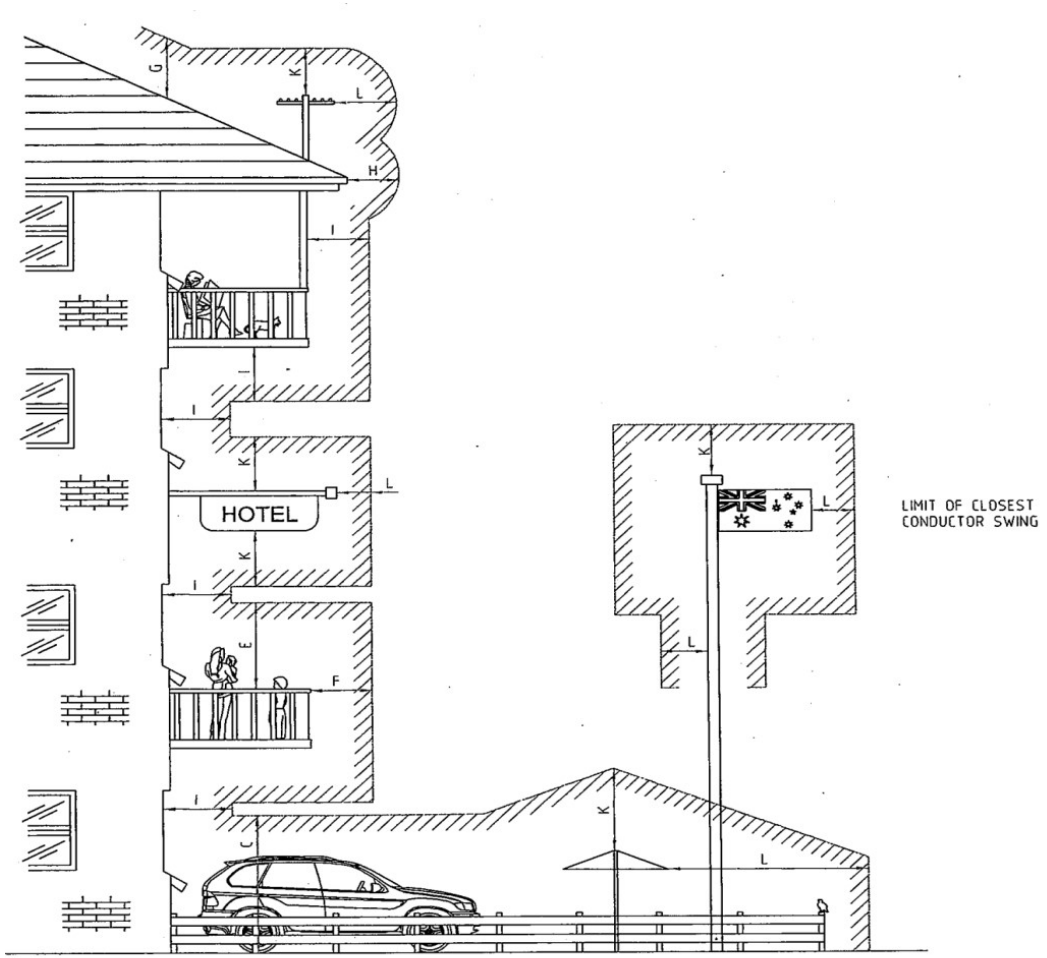
14.1 Distribution Mains Clearances from Ground and Structures

Clearance Type		Location Description	Dimension Code (see 10.1.3)	Direction	LV		HV 1kV – 33kV			HV >33kV, <132kV
					ABC	BARE	Bare & Covered Conductor	Insulated without Earth Screen	Insulated with Earth Screen	Bare & Covered Conductor
Ground	Roads	Over the carriageway		Vertically	5.5m	5.5m	6.7m	6.0m	5.5m	6.7m
		Over roadway other than the carriageway		Vertically	5.5m	5.5m	5.5m	5.5m	5.5m	6.7m
	Other	Private driveways and land traversable by vehicles more than 3m in height (except service stations and farms)		Vertically	5.5m	5.5m	5.5m	5.5m	5.5m	6.7m
		Areas not normally accessible to vehicles more than 3m in height (e.g. swampy areas, gradient > 1:1)		Vertically	4.5 m	4.5m	4.5 m	4.5m	4.5m	5.5m
		Cuttings, embankments and easement boundaries		Horizontally	1.5m	1.5m	2.1m	2.1m	1.5m	5.5m
Structures / Buildings		Unroofed terraces, balconies, sun decks, paved areas etc. that are subject to pedestrian traffic only	E	Vertically (Note 1)	2.7m	3.7m	4.5m	3.7m	2.7m	5.0m
			F	In any other direction	1.0m	1.5m	2.1m	1.5m	1.5m	3.0m
		Roofs or similar structure not normally accessible to persons but on which a person may stand	G	Vertically (Note 1)	2.0m	2.7m	3.7m	2.7m	2.7m	4.5m
			H	In any other direction	1.0m	1.5m	2.1m	1.5m	1.5m	3.0m
		Covered places such as verandas, balconies and windows which can be opened	I	In any direction	1.0m	1.5m	2.1m	1.5m	1.5m	3.0m
		Parts of any structure not normally accessible to persons, incl. blank walls and windows that cannot be opened	K	Vertically (Note 1)	0.6m	2.7m	3.7m	2.7m	2.7m	4.5m
			L	Horizontally	0.1m	0.6m	1.5m	0.6m	0.1m	2.5m
Other High-Risk Situations		Service Poles in the vicinity of OH conductors (refer 10.2.4)		Vertically	1.5m	1.5m	1.65m	1.65m	1.5m	3.0m
				Horizontally	1.0m	2.0m	2.2m	1.5m	1.5m	3.0m
		Over dimension high load transport routes		Vertically	6.7m minimum for all conductors (incl. stay wires and services)					
		Temporary structures including scaffolding		Vertically	Not permitted					
				Horizontally	1.0m	1.5m	2.1m	2.1m	2.1m	3.0m
		Quarries, mines, farms etc. where activities will be in close proximity to power lines (Note 3)			Subject to risk assessment					
		Farms utilising irrigation		Vertically	5.5m	7.5m	7.5m	7.5m	7.5m	7.5m
				Horizontally	7.9m	7.9m	8.5m	8.5m	7.9m	13.0m

See notes on next sheet

Notes regarding Distribution Mains Ground and Structure Clearances table:

1. This should not be taken as meaning only the literal vertical. The actual clearance may also extend outwards in an arc until it interacts with the relevant intersecting dimension.
2. Minimum clearance values are for the following conductor conditions:
    a. Maximum conductor temperature of:
        i. 75ºC for LVABC
        ii. 50ºC for bare open LV,11kV, 12.7kV & 22kV mains
        iii. 50ºC for HVABC
        iv. 50ºC for bare open 33kV mains
    b. Worst condition of conductor swing - 15ºC and 500Pa Wind load
    c. Allowance to be made for inelastic stretch of conductors following installation.
3. The above clearances are a minimum and at times a higher clearance may be warranted. For high-risk locations where machinery and plant are likely to operate in close proximity to power lines a risk assessment should be conducted to determine the most appropriate solution to minimise the risk of contact. Examples of potential high-risk locations include quarries, mines, farms with a need to transport tall centre pivots or grain augers. Possible solutions to be considered include:
    a. relocation of power line to an alternate location
    b. increasing clearances
    c. use of an insulated conductor type
    d. use of an underground cable
    e. installing powerline markers or insulated barriers/covers.
4. The clearances in the above table are for vehicles with a maximum height of 4.6m. Vehicles exceeding 4.6m require a permit from the Government and as part of the permit approval process TasNetworks may be required to survey the intended route.
5. For service conductors' clearance requirements refer section 1.7.



MINIMUM CLEARANCES FROM STRUCTURES

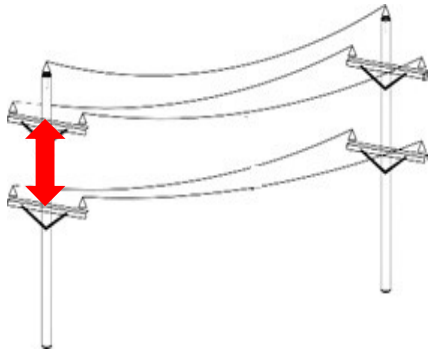
14.2 Intercircuit Clearances

14.2.1 Minimum Spacing Between Circuits at a Pole

			Upper Circuit						
			HV >33kV ≤ 66kV	HV 1kV – 33kV		LV		Other	
			Bare Conductor	Bare and covered conductor, insulated without earthed screen	Insulated with earthed screen	Bare and covered conductor	LVABC	Conductive	Non-conductive e.g. ADSS
Lower Circuit	HV: 33kV > *U* ≤ 66kV	Bare conductor	1.5m						
	HV: 1kV – 33kV	Bare and covered conductor, insulated without earthed screen	1.5m	0.92m	0.92m				
		Insulated with earth screen	1.5m	0.92m	0.2m				
	LV	Bare and covered conductor	1.8m	1.38m	1.38m	0.3m			
		LVABC	1.8m	1.38m	1.38m	0.3m	0.3m		
	Other	Conductive	2.0m	2.0m	2.0m	0.3m	0.3m	0.3m	0.2m
		Non-conductive e.g. ADSS[3]	2.0m	2.0m	2.0m	0.3m	0.3m	0.3m	0.2m

Notes:

1. The clearances listed are distance between kingbolts of upper and lower circuit constructions. Consideration should be given to increasing clearances when designing at clearance limits in situations where there is a height loss on the top circuit and/or a height gain on the lower circuit, e.g. a strain construction or suspension construction above and a pin construction below.
2. The clearances may need to be increased to account for safe approach distances required for construction, operation or maintenance activities.
3. This is a minimum clearance for live line work practice. This dimension may be reduced to an absolute minimum of 1.2m via consultation with TasNetworks on a case-by-case basis.

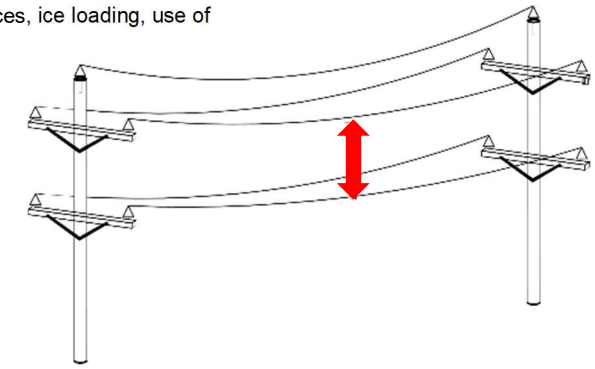


14.2.2 Minimum In-span Spacing between Circuits on Common Poles

			Upper Circuit					
			HV 1kV – 33kV		LV		Other	
			Bare or covered conductor, insulated without earthed screen	Insulated with earthed screen	Bare and covered conductor	LVABC	Conductive	Non-conductive e.g. ADSS
Lower Circuit	HV: 1kV – 33kV	Bare and covered conductor, insulated without earthed screen	0.5m					
		Insulated with earthed screen	0.5m	0.3m				
	LV	Bare and covered conductor	0.5m	0.38m	0.38m			
		LVABC	0.5m	0.38m	0.3m	0.3m		
	Other	Conductive	0.5m	0.38m	0.38m	0.3m	0.3m	0.2m
		Non-conductive e.g. ADSS	1.2m	1.2m	0.3m	0.3m	0.3m	0.2m

Notes:

1. The clearances may need to be increased to account for safe approach distances required for construction, operation or maintenance activities.
2. The clearances are based on the upper circuit being at maximum operating temperature, and the lower circuit at 5ºC.
3. Mid span clearances may need to be increased in situations where the circuit transitions from horizontal to vertical orientation.
4. Consideration should be given to local factors that may adversely affect in-span clearances including bird strike, aircraft warning devices, ice loading, use of irrigators etc.

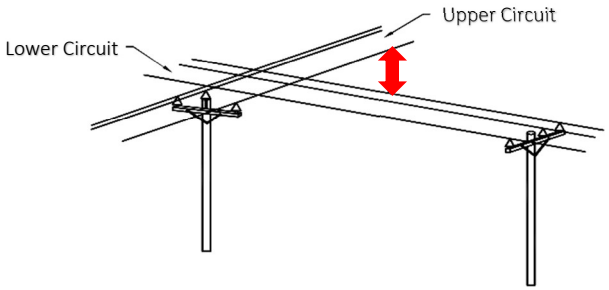


14.2.3 Minimum In-span Spacing between Circuits at Unattached Crossing

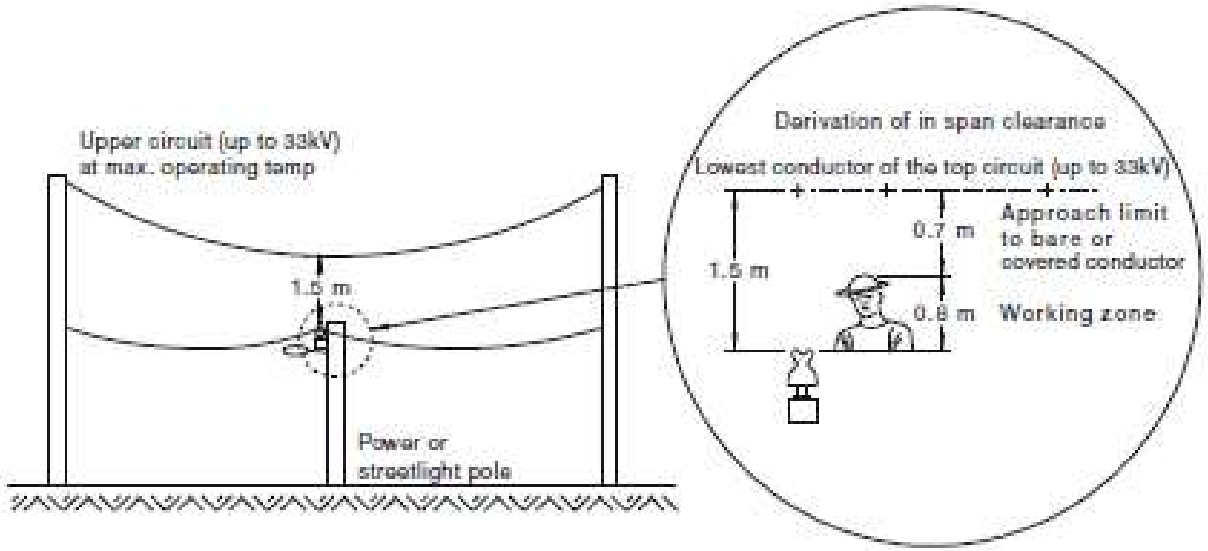
			Upper Circuit					
			HV >33kV ≤ 66kV	HV 1kV – 33kV		LV	Other	
			Bare Conductor	Bare and covered conductor, insulated without earthed screen	Insulated with earthed screen	Bare and covered conductor	Conductive	Non-conductive e.g. ADSS
Lower Circuit	HV: 33kV > *U* ≤ 66kV	Bare conductor	1.8m					
	HV: 1kV – 33kV	Bare and covered conductor, insulated without earthed screen	1.8m	1.2m				
		Insulated with earth screen	1.8m	1.2m	0.6m			
	LV	Bare, covered and insulated	1.8m	1.2m	0.6m	0.6m		
	Other	Conductive	1.8m	1.2m	0.6m	0.6m	0.6m	0.4m
		Non-conductive e.g. ADSS	1.8m	1.2m	1.2m	0.6m	0.3m	0.3m

Notes:

1. The clearances may need to be increased to account for blowout on large spans or safe approach distances required for construction, operation or maintenance activities.
2. The clearances are based on the upper circuit being at maximum operating temperature and the lower circuit at 5ºC.
3. In-span clearances may need to be increased in situations where the circuit transitions from horizontal to vertical orientation.
4. Consideration should be given to local factors that may adversely affect in-span clearances including bird strike, aircraft warning devices, ice loading, use of irrigators etc.



14.2.4 Minimum Spacing from Inter-span Poles



14.3 Clearances from Telecommunications Infrastructure

14.3.1 ADSS and Main Fibre Optic Cable (FOC) Clearances from Ground

Location Description	Min. Clearance
Roads, freeways	5.5m[3]
Designated high load highways, freeways and truck refuelling depots	6.0m[3]
Private or public land parcels that vehicles or machinery may traverse (including commercial property, farmland and paddocks)	5.5m
Commercial, farmland or designated paddock driveways (including residential access to farm properties)	5.5m
Residential driveways	4.6m
Other land not normally accessible to vehicles	4.5m
Navigable waterways or river[4]	12.0m
Railway Line[5]	5.5m

Notes:

1. For NBNCo service drop cables, refer TasNetworks TS-02 document.
2. All clearances are based on FOC temperature of 30ºC.
3. For roadway verge the minimum requirement may be reduced to 4.6m where vehicles cannot traverse.
4. Navigable waterway to be measured at Highest Astronomical Tide for tidal waterways or full capacity for a dam or lake.
5. Railway crossings are to be constructed with a weak link attachment to the poles on either side of the crossing.

14.3.2 ADSS/FOC Clearances from Pole-Mounted Plant

Component	Element	Min. Clearance
Transformer	HV Mains	2.0m
	Top of HV Bushings	0.7m
	Tank	0.2m
	LV Mains	0.3m
Recloser	Top of HV Bushings	2.0m
	Tank	0.2m
Capacitor	Top of HV Bushings	2.0m
	Tank	0.2m
Regulator		NOT PERMITTED ON POLE
Air break switch		2.0m
HV EDOs or Links	Lowest point of fuse/link swing	1.8m
LV Links or Fuses, incl. service fuses		0.8
HV Cable Termination	Point where phase cores separate	1.2m
LV Cable Termination	Point where phase cores separate	0.3m
Street Light Bracket		0.23m
Stay Wires		0.15m

14.3.3 FOC Pit and FDH cabinet clearances from TasNetworks Poles

Pole Type	Clearances for Splice Pits and FDH from Poles with HV Conductors or Apparatus	Clearances for Splice Pits and FDH from Poles with LV Conductors or Apparatus	Clearances for Haulage Pits from HV & LV Poles
Conductive poles (steel/conc)	15m	3m	3m
Timber poles with HV earth attached	15m	3m	3m
All other wood poles	3m	3m	3m

14.3.4 Minimum Clearances from PSTN (Telephone) Cables on JU Poles

TasNetworks Poles

Distribution Network Component	On Pole	In Span
Bare HV Mains >33kV mains	3.0m	2.4m
Bare or Covered HV Mains ≤33kV mains	2.4m	1.8m
NMSHVABC mains	1.2m	1.2m
MSHVABC (metallic earthed screen) mains	0.6m	1.2m
Bare LV or SL mains	1.2m	1.2m
LVABC mains	0.6m	1.2m
Streetlight leads, brackets or fittings	0.05m	0.15m
Stay fittings	0.05m	0.15m
Earth downleads	0.05m	

Telstra Poles

Min. 1.2m clearance between TasNetworks services and Telstra cables/equipment.

14.3.5 Minimum Clearances Between Earthing and Telecommunications Plant

Minimum clearances to be maintained between TasNetworks earths (including conductive poles) and telecommunications infrastructure (pits, pillars, ground-mounted plant) are as shown below.

Power System Earth Type		Pits, pillars, cabinets, payphones	Exchange equipment
LV		0.3m	1m
HV Earth	Separate	15m	15m
	CMEN	2m	2m
SWER Distribution Transformer		15m	30m
SWER Isolating Transformer		25m	50m

14.4 Clearances from Stay Wires

14.4.1 Ground Clearance for Aerial Stay Wires

Situation	Required Min. Clearance
Over Carriageway	5.5m
Over Private Driveways	4.6m
Other Locations	3.0m

14.4.2 Clearance from Mains to Stay Wires

Mains Type	Required Min. Clearance
ADSS	0.15m
LV bare neutral, LVABC	0.15m
LV bare mains active	0.23m
HV bare or covered mains	0.46m
HVABC	0.15m
Operating Platforms	2.6m vertically

14.5 Clearances from Streetlight Brackets

14.5.1 Clearance from streetlights/outreaches mounted on a distribution pole

Mains Type	Required Min. Clearance
ADSS	0.23m
LV bare neutral, LVABC	0.3m
LV bare mains active	0.6m
HV bare or covered mains	1.2m
HVABC	0.3m

14.5.2 Clearance from free-standing non-frangible streetlight poles

Mains Type	Required Min. Clearance
ADSS	0.1m in any direction
LV bare neutral, LVABC, Insulated Service	0.6m vertically 0.3m horizontally
LV bare mains active	1.5m vertically 0.6m horizontally
HV bare or covered mains	1.5m vertically 1.5m horizontally
HVABC	1.5m vertically 0.3m horizontally

14.5.3 Clearance from free-standing frangible streetlight poles

Situation	Required Min. Clearance
Potential impact to the streetlight pole would result in the pole falling clear of the overhead conductors. Note 1	0.6 x SL mounting height
Potential impact to the streetlight pole would result in the pole falling toward the overhead conductors. Note 1	1.2 x SL mounting height

Frangible poles are not to be used in areas of high pedestrian volume (e.g. near schools, bus stops, shopping centres)

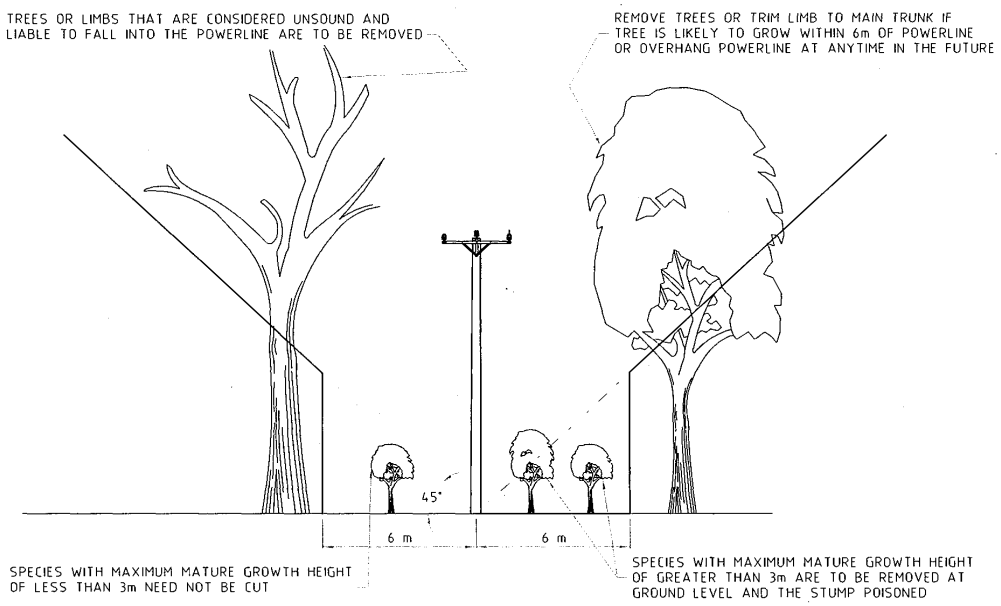
14.6 Vegetation Clearances

14.6.1 Bare Conductor Vegetation Clearances

NEW OR UPGRADED POWERLINES

THE AIM OF CLEARING FOR NEW OR UPGRADED POWERLINE ROUTES IS FOR TASNETWORKS TO UNDERTAKE MINIMAL VEGETATION CLEARING IN THE FUTURE.

ACHIEVEMENT OF THIS AIM MAY NECESSITATE THE CONSIDERATION OF OTHER SUPPLY ALTERNATIVES EG. UNDERGROUND, AERIAL BUNDLED CONDUCTOR, ALTERNATIVE LINE ROUTE ETC.



IT IS ACCEPTED THAT ACHIEVEMENT OF THESE CLEARANCES MAY NOT BE POSSIBLE FOR SOME TREES IN URBAN AREAS AND ALONG SOME ROADSIDES. IN THESE SITUATIONS, WHERE BARE OVERHEAD CONSTRUCTION IS STILL REQUIRED, CLEARANCES LISTED IN THE RELEVANT TABLES IN CHAPTER 8A OF THE TASMANIAN ELECTRICITY CODE SHOULD BE INCREASED TO ALLOW FOR A FURTHER TWO CYCLES OF RE-GROWTH.

NOTES:

* CYCLES ARE GENERALLY TWO YEARS IN RURAL AREAS, AND ONE YEAR IN URBAN AREAS.
* HAZARDOUS VEGETATION OUTSIDE THE CLEARANCE ZONE TO BE REMOVED OR TRIMMED.
* OVERHANGING LIMBS IN RURAL AREAS ARE GENERALLY NOT ALLOWED. EXCEPTIONS ARE TO BE RARE AND SUBJECT TO A RIGOROUS RISK MANAGEMENT ASSESSMENT AND RECORDING.
* ACCESS TO THE EASEMENT MUST BE ACHIEVED TO ALLOW FOR FUTURE MAINTENANCE AND FAULT RESPONSE.

DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED

ALTERATIONS		
ORIGINAL ISSUE		
REPRODUCED FROM DRG No. D-OH1-3.6/3 and D-OH1-0284-SD-001		

TasNetworks

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DESIGNED BY	ELECTRO
CHECKED BY	RAHNAL LIYANAGE
APPROVED BY	ANGUS KETLEY
DATE APPROVED	01 AUGUST 2021

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SCALE: NTS

A4

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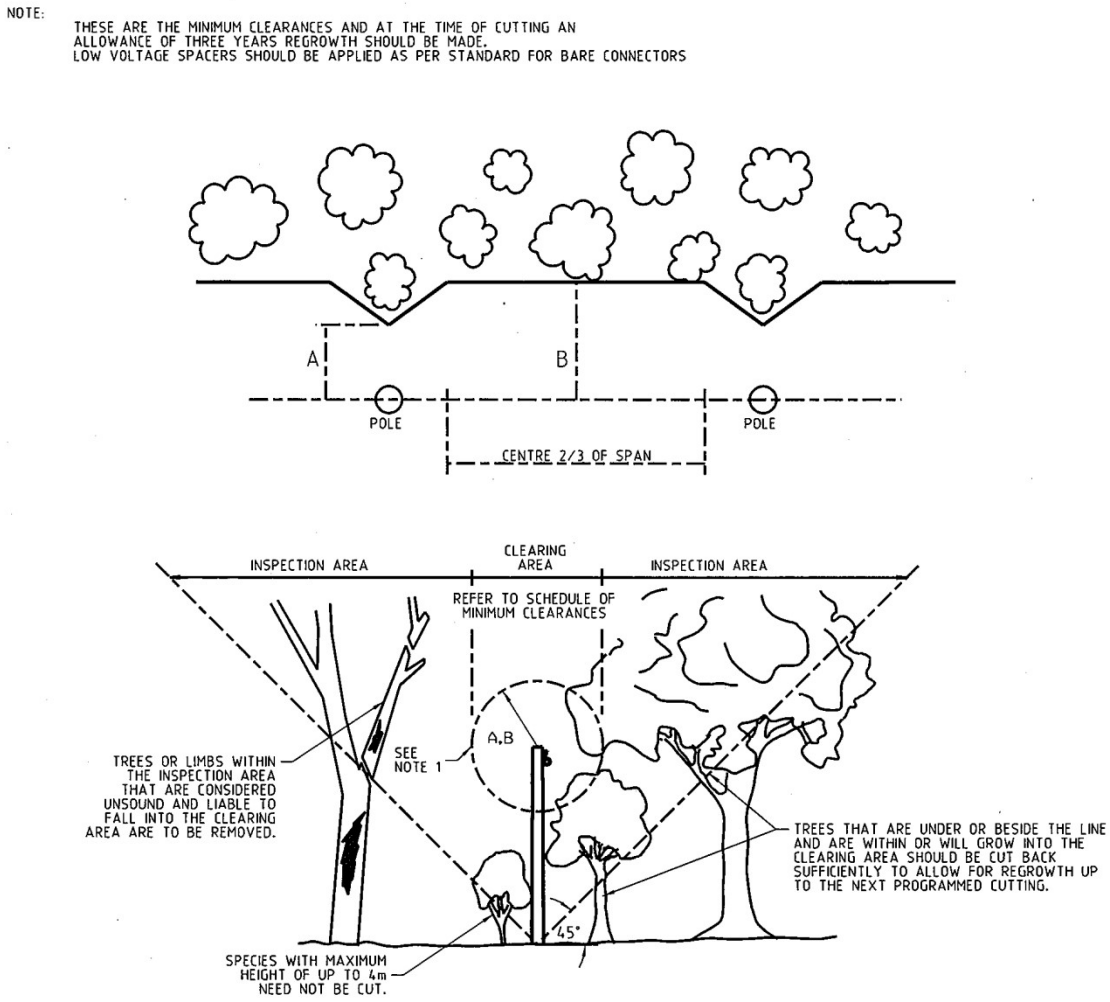
14.6.2 ABC Vegetation Clearances

Voltage	Clearance at Pole	Clearance to Still Cable Centre 2/3 of Span		
		Span <45m	Span 45 – 75m	Span >75m
LV	0.6m	*0.6m*	*1.0m*	*Urban (~50m): 1.5m*
				Rural (~150m): 2.1m
HV	0.7m	*0.7m*	*1.2m*	*Urban (~75m): 1.8m*
				Rural (~150m): 3.0m

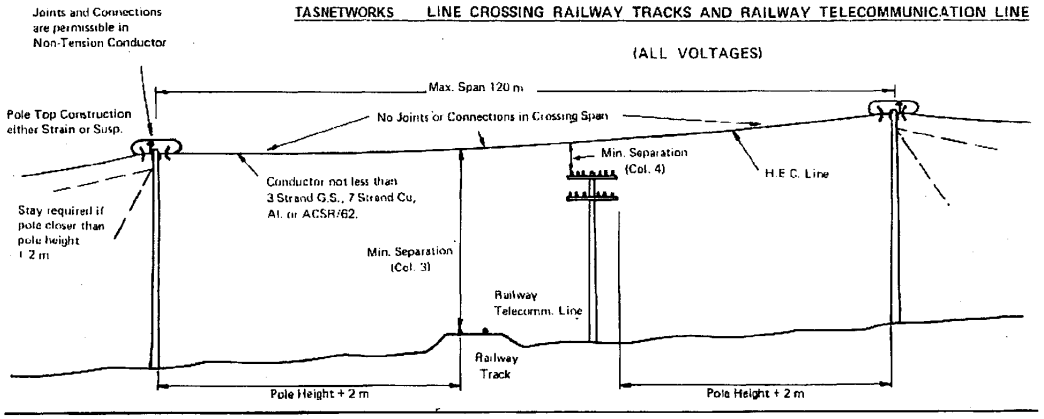


14.6.3 ADSS / FOC Vegetation Clearances

Clearance at Pole	Clearance to Still Cable		
	Span <40m	Span 40 – 70m	Span >70m
0.6m	0.3m	0.6m	0.9m

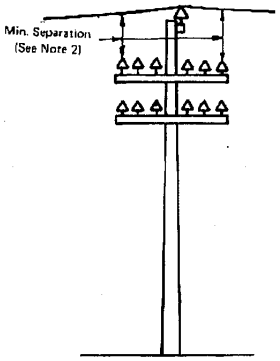
Radial clearances apply – both vertical and horizontal.
Initial clearing should allow for regrowth over clearing cycle.

14.7 Clearances over Railways



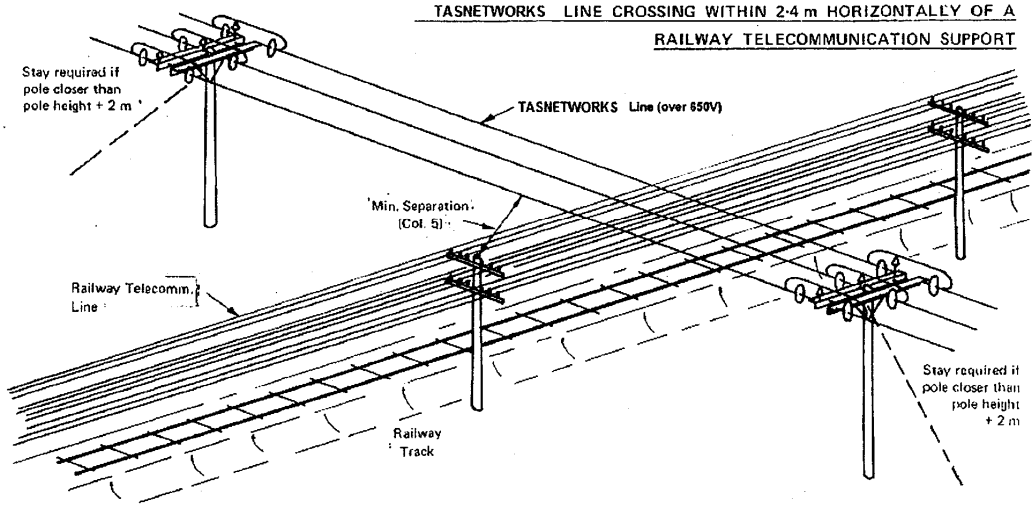
TASNETWORKS LINE CROSSING RAILWAY TRACKS AND RAILWAY TELECOMMUNICATION LINE

(ALL VOLTAGES)



TASNETWORKS LV LINE (0 - 650 V) ATTACHED TO RAILWAY TELECOMMUNICATION SUPPORT

TASNETWORKS LINE CROSSING WITHIN 2·4 m HORIZONTALLY OF A RAILWAY TELECOMMUNICATION SUPPORT



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ALTERATIONS
ORIGINAL ISSUE
REPRODUCED FROM ORG No. D-OH1-3.7/1 AND D-OH1-0297-SD-001

TasNetworks

DRAWN	D J KING
DESIGNED BY	ELECTRO
CHECKED BY	RANMAL LIYANAGE
APPROVED BY	ANGUS KETLEY
DATE APPROVED	01 AUGUST 2021

TITLE: RAILWAY CROSSINGS - CONDUCTOR SEPARATION & CONSTRUCTION DETAILS

SCALE: NTS

A4

D - OHC - P002 - SD - 001

REVISION: A

Clearance over Railways Cont'd

TasNetworks shall, before undertaking work on any new crossing or rearranging an existing crossing, consult with TasRail and obtain approval of the proposal.

		Minimum Separation (m)		
Col 1	Nominal Voltage of Power Conductors	Railway Tracks (Nearest Rail)	Telecommunications Conductors/Cables	Telecommunications Support
1	Up to 650V	5.5	0.9	By approved attachment (Note 2)
2	Over 650V to 11kV	6.7	1.2	3.7
3	Over 11kV to 66kV	6.7	2.1	4.0
4	Over 66kV to 132kV	6.7	3.0	4.6
5	Over 132kV to 220kV	6.7	3.7	5.1

Notes:

1. Separations in column 5 apply to where Tasnetworks conductors are within a horizontal distance of 2.4m from the vertical projection of the nearest point of a telecommunication support.
2. Where TasNetworks LV conductors share the same pole as TasRail's conductors, there shall be a separation of 2.4m for bare LV or 1.8m insulated LV.

REQUIREMENTS FOR SPANS CROSSING RAILWAY INFRASTRUCTURE

1. Maximum Span Length: 120m
2. Angle of crossing: 45° - 90°
3. Minimum conductor size: 3/2.75 SC/GZ, or at least 7 strands for other materials
4. Constructions on adjacent poles: strain or suspension types
5. No tension joints or connections in crossing span
6. Poles to be:
   - located at a distance equal to pole height + 2m away from track or telecommunications conductors, OR
   - stayed so that they cannot fall onto tracks or telecommunications conductors in the event of pole base failure.

14.8 Clearances from Flammable Materials

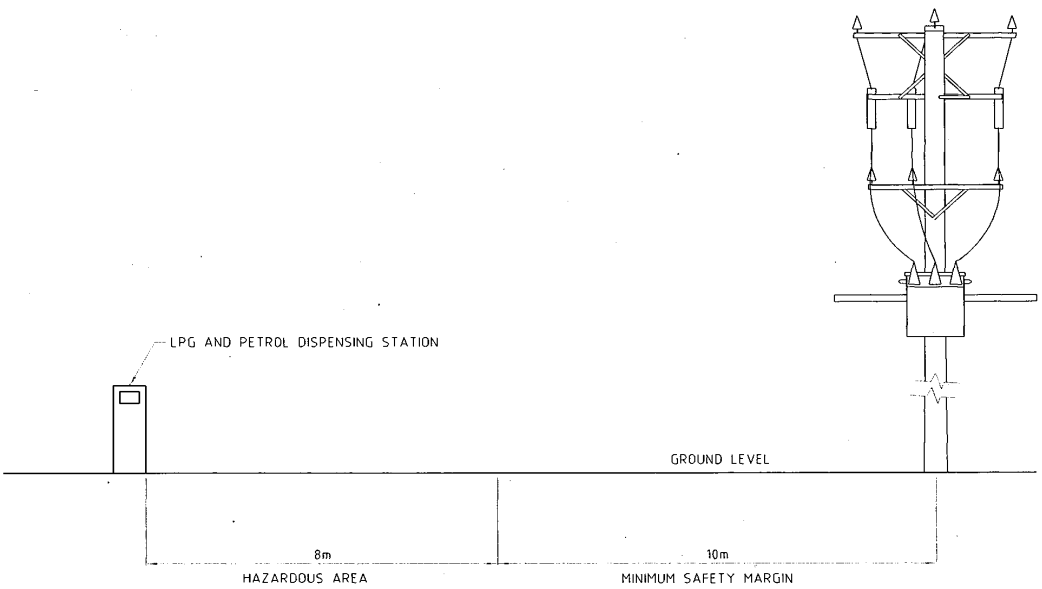
Distribution Equipment	Hazardous Area			Minimum Safety Margin (to be added to Hazard Zone)	**Recommended Horizontal Clearance[2]** (Hazardous Area + Safety margin)		
	Petrol and LPG Storage Tanks	Diesel Storage Tanks & Dispensing Station	Petrol and LPG Dispensing Station[3]		**Petrol and LPG Storage Tanks[1]**	**Diesel Storage Tanks & Dispensing Station**	**Petrol and LPG Dispensing Station**
Distribution pole or substation with EDO fuses	15m	5m	8m	10m	25m	15m	18m
HV Links, air-break switches, HRC fuses and lightning arresters	15m	3m	8m	5m	20m	8m	13m
Ground type substations and indoor substations	15m	4m	8m	1m	16m	5m	9m
LV pole with fuses, pillars and turrets, or LV service fuses	15m	3m	8m	1m	16m	4m	9m

Refer *AS2430* Part 3 - Classification of Hazardous Areas – Specific occupancies. None of the distribution equipment listed should be located within the recommended horizontal clearance, measured from the source of the hazard.

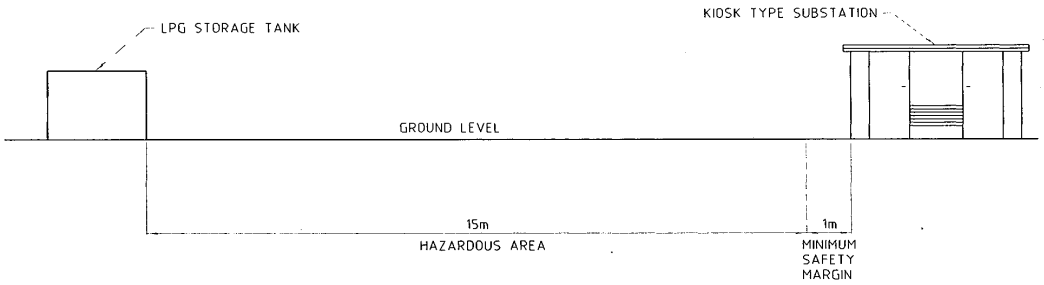
Notes:

1. Where the recommended minimum horizontal clearance cannot be achieved, the hazardous area may be reduced in accordance with *AS2430* Part 3 Section 9.2.4.
2. The recommended horizontal clearance indicated is the horizontal distance measured in any direction from the source of the hazard to the boundary of the equipment installed at ground level, or centre of pole for overhead equipment.
3. The hazardous area for LPG dispensing stations is either 8m horizontally from the cabinet or 3m horizontally from the hose nozzle, whichever is the greater.
4. a) Cylinder filling: The hazardous area for outdoor cylinder filling is 7m horizontally from the fill point.
   b) Outdoor cylinder installation, in situ fill type: The hazardous area extends 10m horizontally from any cylinder valve. The hazardous area may be reduced in accordance with AS2340 Part 3 Section 9.2.4.

Clearances from Flammable Materials



EXAMPLE 1



EXAMPLE 2

NB
REFER TO DRAWING D-OH1-0294-SD-001
FOR NOTES

DIMENSIONS ARE IN MILLIMETRES
UNLESS OTHERWISE STATED

ALTERATIONS
ORIGINAL ISSUE
REPRODUCED FROM DRG No. D-OH1-3.6/13 AND D-OH1-0293-SD-001

TasNetworks

DRAWN	D J KING
DESIGNED BY	ELECTRO
CHECKED BY	RANMAL LIYANAGE
APPROVED BY	ANGUS KETLEY
DATE APPROVED	01 AUGUST 2021

TITLE: FLAMMABLE MATERIAL - CLEARANCES FROM DISTRIBUTION EQUIPMENT

SCALE: NTS

A4

D - OHC - P003 - SD - 001

REVISION: A