CHAPTER 15 – CLEARANCES FOR OVERHEAD POWER LINES

Tables

Attachments

1. FOREWORD

Once the safety clearances in this chapter have been established, it is the responsibility of any second comer (eg anyone who subsequently erects structures in the vicinity of an overhead line) to ensure that they are maintained.

For “BT” read telecommunication. (Note that any references to “BT”, including related and referenced documents, are not necessarily specific to that company in respect of the information contained in the main body of this chapter.)

2. INTRODUCTION

This Chapter of Code of Practice 420 Part 2 defines clearances for the steel tower, overhead line network owned and operated by Electricity North West Limited (Electricity North West). It is divided into sections according to the type of clearance under consideration. Note that small footprint steel towers are included in Code of Practice 420, Part 1.

The clearances stated in Table 2.1 below form the basis of all the clearances quoted in this chapter. These clearances have been extracted from ENA TS 43-8 Appendix A and are based on the philosophy detailed in that appendix, ie “the clearances to objects shall be maintained such that under no circumstances will the ‘safety distance’, as quoted in the Distribution Safety Rules, be infringed.” For the conditions and derivation of the safety distances, refer to ENA TS 43-8. These safety distances give rise to two basic clearances from which all other clearances are derived: normal clearance and passing clearance.

Table 2.1: Safety Distance and the Basic Clearances

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
Safety Distance	0.8	1.4	ENA TS 43-8
Normal Clearance (See Note 1)	3.0	3.6	ENA TS 43-8
Passing Clearance (See Note 2)	0.8	1.4	ENA TS 43-8

NOTES:

1. This is the minimum distance between the conductor at maximum sag (hanging vertically, or deflected by an angle of up to 45°) and an object. It is not normal to permit any object to be placed above an electric line. If a person can stand on the object or any temporary object adjacent to it, the normal clearance shall include an ‘application factor’ of 2.2m to allow the person to move their arm whilst holding a short metallic object. Should it be necessary for a person to move their arm whilst holding a longer object, the clearance shall be increased by the length of that object.

2. This is the minimum distance between the conductor at maximum sag (hanging vertically, or deflected by an angle of up to 45° towards an object) and the object, when the object is moving relative to the line. The passing clearance, therefore, does not normally require an ‘application factor’, since it is intended for objects that are moving relative to the line and on which no person is standing. This clearance can also be applied to any object when there is no likelihood of any temporary platform being situated adjacent to it.

Current design and construction clearances are given, divided into sections for particular types of clearance. Section 4 deals with basic overhead line clearances, with the sections that follow giving consideration to particular local conditions such as road and river crossings. Note that for the purposes of this chapter a "road" can be an unmade track to a farm as well as a conventional tarmac surface that is accessible to vehicular traffic. 10/03/17

Safe climbing clearances for steel towers are given in Attachment A.

3. SCOPE

3.1 General

This chapter covers clearances to be used by Electricity North West for overhead lines on steel towers, with the exception of small footprint steel towers which are included in Code of Practice 420, Part 1. New lines and refurbished lines are covered.

3.2 Type of Conductor

Unless otherwise stated, clearances are to uninsulated or covered conductors as stated.

3.3 Conductor Conditions

Clearances are given for the specified maximum conductor temperature with the conductor (including its suspension insulators if fitted) hanging vertically in still air or deflected at any angle up to 45° from the vertical. The clearances apply in any direction.

3.4 Actual Clearances

In general, minimum clearances are given. Actual clearances may be different according to local circumstances determined at the design stage of the overhead line.

3.5 Overhead Line Clearance Checks

Checks of line clearances shall be carried out during inspections as detailed in CP421 to ensure compliance with statutory and Electricity North West's policy requirements.

4. GROUND, DOWNLEAD AND JUMPER CLEARANCES

4.1 Minimum Ground Clearance (Datum Line)

The ground clearance (datum line) of any conductor at its maximum likely temperature or bare live metalwork shall not be less than the values given in Table 4.1.

Exceptions to this requirement are:

- Any conductor surrounded by insulating material suitable for the conditions under which it is to be used.
- Any conductor which is not surrounded by insulating material and which is at least 4.3m above ground and which connects transforming, switching or other equipment mounted on supports carrying conductors with other such equipment or with any other conductor.
- Any conductor connected to earth.

Table 4.1: Minimum Ground Clearance

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
Conductor at any point not over road. (See Notes 1 and 2.)	6.0	6.7	ENA TS 43-8
Bare live metalwork, eg jumper connections. (See Note 3.)	4.3	Controlled Zone Safety Rules apply	ENA TS 43-8

1. The minimum clearance for ≤33kV lines constructed before 1/1/2000 is 5.2m and after that date 6.0m as above.
2. ACSR and aluminium alloy conductors require additional clearance of 450mm.
3. These clearances apply to supports of overhead lines which in addition support items such as transformers, isolators and cable sealing ends.

4.2 Downleads and Jumpers

Minimum clearances between downleads for steel tower power lines in still air shall be as given in Table 4.2. Reduced clearances may be permitted by the Engineer based on conditions of maximum (opposing) conductor swings and sags.

Table 4.2: Minimum Clearances Between Downleads for Steel-Tower Power-Lines (still air)

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
A. Normal clearance between downleads.	2.5		ENA TS 43-2
B. Special minimum clearance between downleads if agreed.	1.5		ENA TS 43-2

4.3 Clearance Around Base of Tower

A 3m clearance is required around the base of all towers for maintenance. This clearance zone shall extend from any part of the structure forming part of the tower to any other structure, such as buildings, fences etc.

If excavation is to take place near a tower, a "pillar of support" comprising 15m of undisturbed land, measured from the tower centre, with a subsequent batter not steeper than 1 vertical to 2 horizontal shall be allowed.

5. CLEARANCES FOR OVERHEAD LINES CROSSING OR IN CLOSE PROXIMITY

The following minimum clearances (Table 5.1) apply where overhead lines cross or are in close proximity to one another. In all cases the clearances shall be determined by the ultimate system voltage of the upper or lower line, whichever is the greater.

Table 5.1: Clearances for Overhead Lines Crossing or in Close Proximity

Description of Clearance	Minimum Clearance (m)					
	Nominal System Voltage (kV)					
	0.4	**11**	**33**	**132**	**275**	**400**
LV ABC. (See Note 1.)	1.0*	1.8	2.0	2.7	3.7	4.4
Lowest line conductor or earth wire of upper line to highest line conductor of lower line. (See Note 2.)	1.0	1.8	2.0	2.7	3.7	4.4
Lowest line conductor or earth wire of upper line to earth wire over lower line (where erected). (See Note 2.)	0.7	1.4	1.6	2.7	3.7	4.4
Lowest line conductor or earth wire of upper line to any point on a support of the lower line on which a person may stand. (See Note 3.)	2.7	2.8	3.0	3.6	4.6	5.3
Support of upper line and any conductor of lower line. (See Note 3.)	7.5	7.5	7.5	15.0	15.0	15.0
Lines in close proximity to each other. (See Note 4.)	Falling distance of highest voltage line plus a safety distance of 1.5 metres.					

NOTES:

1. * Increases to 1.25 if ABC is the upper line.

HV lines shall always be crossed with the LV ABC span lowermost. Under no circumstances shall ABC cross over HV or EHV lines, as tension limiting devices fitted to the ABC will allow the bundle to drop below the design clearance.

2. One of the following methods of determining clearances shall be adopted:

(a) With the upper conductors or earth wire hanging vertically and the lower conductors or earth wire deflected at 45° under the following conditions:

(i) Upper conductor at its specified maximum temperature coincident with lower conductor at an assumed temperature of 25°C less than its specified maximum temperature.

(ii) Lower conductor at a temperature of -5.6°C (no ice) coincident with upper conductor at an assumed temperature of 20°C.

OR

(b) With the upper conductor or earth wire hanging vertically at its specified maximum temperature and the lower conductor or earth wire deflected at any angle up to 45° at a temperature of -5.6°C (no ice). In localities where there is a high likelihood of conductor icing it may be appropriate to consider the effects of such icing.

3. Clearances shall be obtained with the conductor or earth wire at its specified maximum temperature and deflected by any angle up to 45°.

4. This rule does not apply when a tower is in close proximity to a wood pole line. Falling distance of the lower voltage line shall be used in this case.

6. CLEARANCES FOR ROAD CROSSINGS

6.1 Where overhead lines cross roads, the clearances for the given types of road shall not be less than the values given in Table 6.1.

6.2 ACSR and aluminium alloy conductors require an additional clearance of 450mm above those given.

Table 6.1: Clearances for Road Crossings

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
A2. Line conductor to road surface except as specified below. (See Note 1.)	6.0	6.7	ENA TS 43-8
B. Line conductor to road surface of designated "6.lm High Load" routes. (See Note 2.)	6.9	7.5	ENA TS 43-8
C. Line conductor to motorway or other road surface where the "Skycradle" can be used. (See Notes 3 and 5.)	See Note 6	8.8	ENA TS 43-8
D. Line conductor to motorway road surface where scaffolding is to be used on:			ENA TS 43-8
(i) Normal 3 lane motorways.	See Note 6	14.6	
(ii) Elevated 2 lane motorways.	See Note 6	11.6	
(See Notes 4, 5 and 6.)			

NOTES:

1. The minimum height of any wire or cable which is attached to a support carrying an overhead line conductor is 5.8m above any roadway irrespective of the line voltage. The clearances specified allow for the safe passage below the overhead line of a vehicle of maximum height 5m. All new lines constructed on or after 1/1/2000 shall have a design clearance of 6.0m. It may be necessary to increase the clearance dependant on the use and for what purpose vehicles on the land may be used.
2. "High Load" routes are roads designated by the Department of the Environment for which the higher load clearance of 6.lm shall be maintained.
3. These clearances allow for the positioning of the Skycradle under a live circuit. Where the circuit under which the Skycradle is to be positioned and any adjacent circuit can be made dead during the slewing of the Skycradle these clearances can be reduced to 7.6m for all voltages.
4. In situations where the Skycradle cannot be used to erect or maintain lines which cross a motorway, these clearances shall be adopted. They allow for the erection of scaffolding and/or guard netting with the overhead circuits live.
5. Should the use of Skycradles or the erection of temporary scaffolding in proximity to overhead lines be considered, then appropriate guidance shall be sought relating to acceptable working methods and appropriate preparation prior to any work commencing.
6. Only new 132kV lines can be constructed over motorways. Any other voltage is not permissible.

7. CLEARANCES FOR BRITISH TELECOM (BT) LINES AND PROPERTY

Telecommunication crossing lines are NOT permitted to cross 33kV and 132kV power lines.

For further information on clearances between power lines and telecommunication lines, refer to Engineering Recommendation (ER) PO5.

8. CLEARANCES FOR OBJECTS, STREET LIGHTING STANDARDS/COLUMNS, BUILDINGS AND STRUCTURES

8.1 Objects

Table 8.1 gives minimum clearances between objects and overhead line conductors.

Table 8.1: Minimum Clearances between Objects and Overhead Line Conductors

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
A. Overhead line conductor to any object that is ordinarily accessible, ie on which a person may stand, including permanently mounted ladders and access platforms. (See Note 1 and Drawing I-420-1.15-003.)	3.0	3.6	ENA TS 43-8
B. Overhead line conductor to any object to which access is not required AND on which a person cannot stand or lean a ladder. (See Note 2.)	0.8	1.4	ENA TS 43-8

NOTES:

1. These are the minimum clearances that shall be maintained between an overhead line conductor and a normally accessible structure or surface of a building (walls, roof, windows, etc). They permit a person to stand on or against these structures, but only allow for free movement of short hand-held objects.

2. Account should be taken of the possible movements of the object, eg flag pole in the wind. These clearances also apply to moving objects to which access is precluded during passage below the line. The height or position of the object should take into account any possible undulating or rocking movement of the object, eg. a mobile crane jib travelling over uneven ground.

8.2 Street Lighting Standards/Columns

Table 8.2 and Drawing I-420-1.15-004 give minimum clearances between street lighting standards and overhead line conductors.

Table 8.2: Minimum Clearance between Street Lighting Standards and Overhead Line Conductors

Description of Clearance (Refer to Drawing I-420-1.15-004)	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
A. Overhead line conductor to street lighting standards with:			ENA TS 43-8
(i) Standard in normal upright position.	1.7	2.3	
(ii) Standard falling towards overhead line with conductor hanging vertically only.	1.7	2.3	
(iii) Standard falling towards line with conductors at 45°.	0.4	0.8	
B. Platform on which a person may stand.	3.0	3.6	ENA TS 43-8

NOTES:

1. The clearances given in Table 8.2A(i) assume that maintenance platforms will be positioned such that clearances given in Item A of Table 8.1 are maintained.
2. The clearances given in Table 8.2A(ii) include additional clearance to allow for the erection of street lighting standards.

8.3 LPG Fixed Storage Installations

The following guidance applies to new overhead lines. It is the second comer's responsibility to ensure that safety clearances are maintained.

Table 8.3 gives minimum clearances between liquid petroleum gas (LPG) storage vessels and overhead lines. The clearances are taken from the LP Gas Association, Code of Practice 1. This code of practice covers "above ground installations where LPG is stored under pressure at ambient temperatures in fixed vessels larger than 75kg LPG capacity." No part of an LPG storage installation (eg storage vessels, vaporisers, pumps, gas-air mixing plants) shall be located directly beneath an overhead line.

Where the clearances in Table 8.3 are less than other relevant clearances within this chapter, eg Table 8.1, then the greater clearance shall be used.

Note that care needs to be taken in the proximity of such sites to allow sufficient clearance for LPG tankers and refilling operations.

Table 8.3: Minimum Clearances to LPG Storage Vessels

Description of Clearance	Minimum Clearance (m) for Nominal System Voltage ≥1 kV
Horizontal clearance between conductor (or live metal work) nearest to LPG storage vessel and nearest point of LPG storage vessel.	10.0

9. CLEARANCES FOR RAILWAY CROSSINGS AND STRUCTURES

The minimum vertical clearances are given in Table 9.1.

Table 9.1: Minimum Vertical Clearances for Railway Crossings and Structures

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
Conductor or earth wire to:			
A. Ground level.	6.1	6.7	ENA TS 43-8
B. Ground level at roads or yards where road mobile cranes are likely to be employed.	10.7	11.2	ENA TS 43-8
C. Rail level. (See Note 1.)	7.3	8.0	ENA TS 43-8
D. Buildings, gantries or other structures on which a man might stand and to traction wires. (See Note 1.)	3.0	3.7	ENA TS 43-8
E. Poles and other projections.			
F. Any wires other than traction	2.4	3.0	Railway Master Wayleave Agreement (ENA ER L31)
wires. (See Note 2.)	1.8	2.4	
G. Railway power circuit with bare conductors. (See Note 2.)	1.2	Not applicable	
H. Railway power circuit with insulated conductor, or any earthed part of BR circuit.	0.9	Not applicable	
I. Railborne crane jib - minimum working clearance.	1.22	2.4	

NOTES:

1. The clearances specified in (C) and (D) do not incorporate any allowances for use of scaffolding or Skycradle across railway tracks/traction wires during erection/maintenance of overhead lines. Clearances of 2.75m and 4.9m are required between scaffold net or Skycradle boom and traction wires and rail respectively.
2. In special cases where it is agreed that overhead lines may pass under railway wires, or for an insulated line conductor, the minimum clearance can be reduced to 0.9m (33kV and below only).

10. VULNERABLE SITES

Electricity North West's policy for apparatus in the vicinity of high risk sites is described in EPD473.

10.1 New Lines

Where an overhead line passes over a vulnerable site, as defined in EPD473, the following clearances shall apply:

- All conductor-to-ground clearances shall be not less than 7.6m (excluding insulated 230/400V slack final service spans), with a minimum vertical conductor clearance of 4.3m over any structure on which a person might stand. Where new lines are erected over or in the vicinity of vulnerable sites, the use of covered conductor shall be considered. (Refer to EPD473 for more information.)

- Where masted boat activity is a feature, due regard shall be paid to mast height expected on the site, and due allowance made where appropriate for the passage of a boat mounted on a trailer with the mast erected and a pass under clearance as in Table 8.1B. Crossing points and clearances shall be negotiated; provision of danger notices shall be in accordance with Chapter 09. 10/03/17

- Clearance over water shall be as specified by the appropriate Water Authority or, where private waters are concerned, by agreement which will allow for a pass under clearance as in Table 8.1. All heights shall be based on high water level. 10/03/17

10.2 Existing Lines Over or Adjacent to Existing Recreational Sites

The clearances and other safety measures specified for new lines shall not automatically be considered retrospective for existing lines. However, where site examination has indicated that additional safety measures are desirable, consideration shall be given to (amongst other measures): the provision of additional line/ground or line/structure clearances; the use of covered conductors; or the undergrounding of the overhead line. (Refer to EPD473 for more information.)

11. CONSTRUCTION SITES AND WORK IN PROXIMITY TO OVERHEAD LINES

11.1 General

This Section deals with clearances associated with the use of plant and vehicles in proximity to overhead lines. Where work is undertaken using ladders, scaffold, mobile platforms, etc, refer to the appropriate Section in this Chapter (unless other risk mitigation is used, eg temporary shrouding of the conductor).

Whenever work is to be carried out in proximity to overhead lines, consideration shall always be given to the possibility of making the line dead, or diverting it around the area affected.

The Health and Safety Executive (HSE) provide guidance for the avoidance of danger from overhead lines in their guidance note GS6. Electricity North West shall be prepared to provide, in writing, safety clearances and advice on safe working methods to those working in proximity to overhead lines. Where work can only be carried out safely with the line dead, this shall be the subject of precise written agreement between Electricity North West and the site operators.

11.2 Clearances on Sites Where There Will Be NO WORK Under Line

In accordance with HSE guidance note GS6, Electricity North West shall be contacted for advice by any party proposing to work within 9m of a line erected on wood poles and within 15m of a line erected on steel towers.

Refer to drawings I-420-1.15-007 and I-420-1.15-008 for barrier positions, goal-post locations and associated horizontal clearances. Note that site conditions will dictate whether or not these clearances are adequate; consideration shall be given to line parameters (ie span length, maximum sag, etc) when calculating an actual clearance. Table 11.1 gives minimum vertical passing clearances for fixed-height and variable-height loads. These clearances shall be used to determine:

- The horizontal distance from line to goal-posts to avoid any possible clearance infringement by either:

  Vehicles passing under the line, or

  Vehicles that are too high to pass under the line and need to stop at the goal-posts.

- The height of the goal-posts. The maximum height of the underside of the barrier shall be the minimum ground clearance of the line less the specified passing clearance from Table 11.1.

Table 11.1: Vertical Passing Clearances

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
A. Passing clearance of fixed-height load.	0.8	1.4	ENA TS 43-8
B. Passing clearance of variable-height load.	2.3	3.2	ENA TS 43-8

11.3 Clearances on Sites Where There Will Be Work Under Line

11.3.1 General

Work beneath the line shall be deemed to be any work carried out within the minimum horizontal distances specified on drawings I-420-1.15-007 and I-420-1.15-008.

HSE guidance note GS6 provides recommendations for working under the line, and uses two cases:

- "Work at ground level only (for example pipe laying)"
- "Erection of buildings or structures underneath an overhead line"

In both cases the clearances are the same as those given in Table 11.1, Clearance A.

11.3.2 Work at Ground Level Only

Where work is carried out at ground level, only the passing clearance of fixed-height loads is permissible, as HSE guidance note GS6 requires that no vehicle or item of plant shall reach beyond the safe clearance limit. Where plant has the capability to reach beyond the safe clearance limit, it shall be fitted with a physical restraint in order to prevent such action. HSE guidance note GS6 requires that all such work shall be "under the direct supervision of a responsible person".

11.3.3 Work on Buildings or Structures Underneath an Overhead Line

This includes all work under an overhead line and includes new construction, work on existing structures and demolition. Prior to any work being started, a physical barrier to prevent clearance infringement shall be erected as described below. (If, during the construction of the barrier, safety clearances would be infringed, the line shall be made dead before erection of the safety barrier starts.)

- A horizontal safety barrier shall be erected to form a roof between the area of work and the overhead line, such that the safe clearance limit cannot be infringed.
- The distances given in Table 11.1, Clearance A shall be treated as minimum necessary clearances, and shall be used to calculate the height of the underside of the physical barrier.
- Where a conductive material is used to form the barrier, this shall be earthed.

12. WATERWAYS AND RESERVOIRS

Clearances between overhead lines and waterways are not subject to a single national agreement but are dealt with by agreement with the appropriate Authority. Measurements shall be made from the level of a towpath of a canal or the adjacent bank of a reservoir.

Such stretches of overhead line shall be designed with reference to the Joint Safety Guideline document SMCC008 (produced on behalf of the Electricity Industry and British Waterways). Although this document does not detail clearances, it lists factors to be taken into account when determining clearances, ie:

- The size and shape of craft passing along the waterway under the line.
- The rise and fall of the tides.
- The line voltage.
- Conductor loadings.
- Air temperature and wind conditions.
- The presence of cuttings, embankments and waterside structures.
- Activity being carried out at the waterside.

If information from any authority is difficult to obtain, then the guidance given in Section 10 shall be used.

13. TREES, ORCHARDS, FORESTS, PLANTATIONS AND FARMLAND

13.1 Tree Clearances

Clearances given in Table 13.1 and Drawing I-420-2.15-001 ensure that reasonable provision is made for the safety of the public, for the safety of personnel engaged in tree lopping/felling on behalf of Electricity North West and for security of supply. Read the drawing in conjunction with the following notes:

- Clearance lines A and B given in the drawings are based on electrical and "safety of public" considerations. They do not provide for avoidance of mechanical damage to an overhead line when trees or branches, whose growth is higher than the conductors, fall.

- For all 132kV lines, and 33kV lines of high system importance, clearance line D represents the clearance requirement in respect of falling trees. It should be applied to all 132kV lines, and, at the discretion of the Engineer, to 33kV lines of high system importance.

- If an overhead line is within the falling distance of a tree, and permission for removal of the tree is granted by the owner, then the tree should be removed. An appropriate payment for the tree can be made to the owner or, with the owner's agreement, a single tree or number of trees can be planted on the land away from the overhead line and outside the falling distance of the full-grown tree(s).

- Minimum tree clearances shall be maintained at all times.

Table 13.1: Tree Clearances

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
A. Line conductors to that part of a tree under/adjacent to the line and:			
(i) Unable to support ladder/climber.	0.8	1.4	ENA TS 43-8
(ii) Capable of supporting ladder/climber.	3.0	3.6	ENA TS 43-8
(iii) Trees falling toward the line with conductors hanging vertically only. (See Note 1 and Drawing I-420-2.15-001.)	0.8	1.4	ENA TS 43-8
B. Line conductors to trees in orchards and hop gardens. (See Note 2.)	3.0	3.6	ENA TS 43-8

NOTES:

1. Clearances quoted in A(i) and (ii) are minimum acceptable safety clearances, but in practice, the clearances specified on Drawings I-420-1.15-010 and -011 are necessary to take account of growth rates of trees and swaying of trees and branches in the wind. Clearances quoted in A(iii) are recommended in order to protect lines from falling trees, but due to wayleave considerations, will not always be attainable. Detailed guidance on safe tree working in proximity to overhead electric lines is contained in ENA ER G55/2.

2. These clearances shall be obtained vertically when any part of a tree is within 7.5m horizontally of a line. For hop gardens, the clearances apply to the strain wires forming the mesh supporting the system.

13.2 Passage Roads

Where passage roads (roads not to be used for timber operations) pass beneath overhead lines, a goal-post arrangement (see Drawing I-420-1.15-013) shall be in use to identify the 'maximum safe headroom clearance'. This clearance is obtained by subtracting the clearance value given in Table 13.2 from the height of the lowest overhead line conductor under maximum sag conditions at the passage point.

Goal posts should be erected at a minimum distance of 9m from the overhead line and on each side of it.

Table 13.2: Clearances to Passage Roads (Forests and Plantations)

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
Vertical clearance for vehicles and loads of fixed height on unmetalled roads.	1.1	2	ENA ER G55
NOTE: Maximum vehicular height is 4.7m.			

13.3 Farmland

As a general guide the clearances for irrigators, slurry guns, high pressure hoses and rain guns should be as given in Table 13.3.

Table 13.3: Clearances for Irrigators, Slurry Guns, High Pressure Hoses and Rain Guns

Description of Clearance	Minimum Clearance (m)		Reference Documents
	Nominal System Voltage (kV)		
	≤33	132	
Minimum safe distance from power line.	30	30	ENA ER G45
NOTE: The above safety clearance may be reduced at the discretion of the Engineer dependent upon the type of irrigator in use. Reference should be made to ER G45, Notes of Guidance for Electricity Boards on the Use of Irrigators in the vicinity of Overhead Lines, to ascertain the clearances required in specific circumstances.			

14. ASSOCIATED DRAWINGS

I-420-1.15-003	Clearance to objects (on which a person can stand), source ENA TS 43-8
I-420-1.15-004	Clearance to lighting standards, source ENA TS 43-8
I-420-1.15-007	Construction site – single track goal-post location and arrangement, source HSE GS6
I-420-1.15-008	Construction site – double track goal-post location and arrangement, source HSE GS6
I-420-1.15-013	Forests and plantations – goal-post location and arrangement, source ER G55
I-420-2.15-001	Recommended minimum tree clearances for 132kV tower lines
I-420-2.15A1-001 to ...2.15A6-006	Refer to Attachment A for complete listing

15. DOCUMENTS REFERENCED

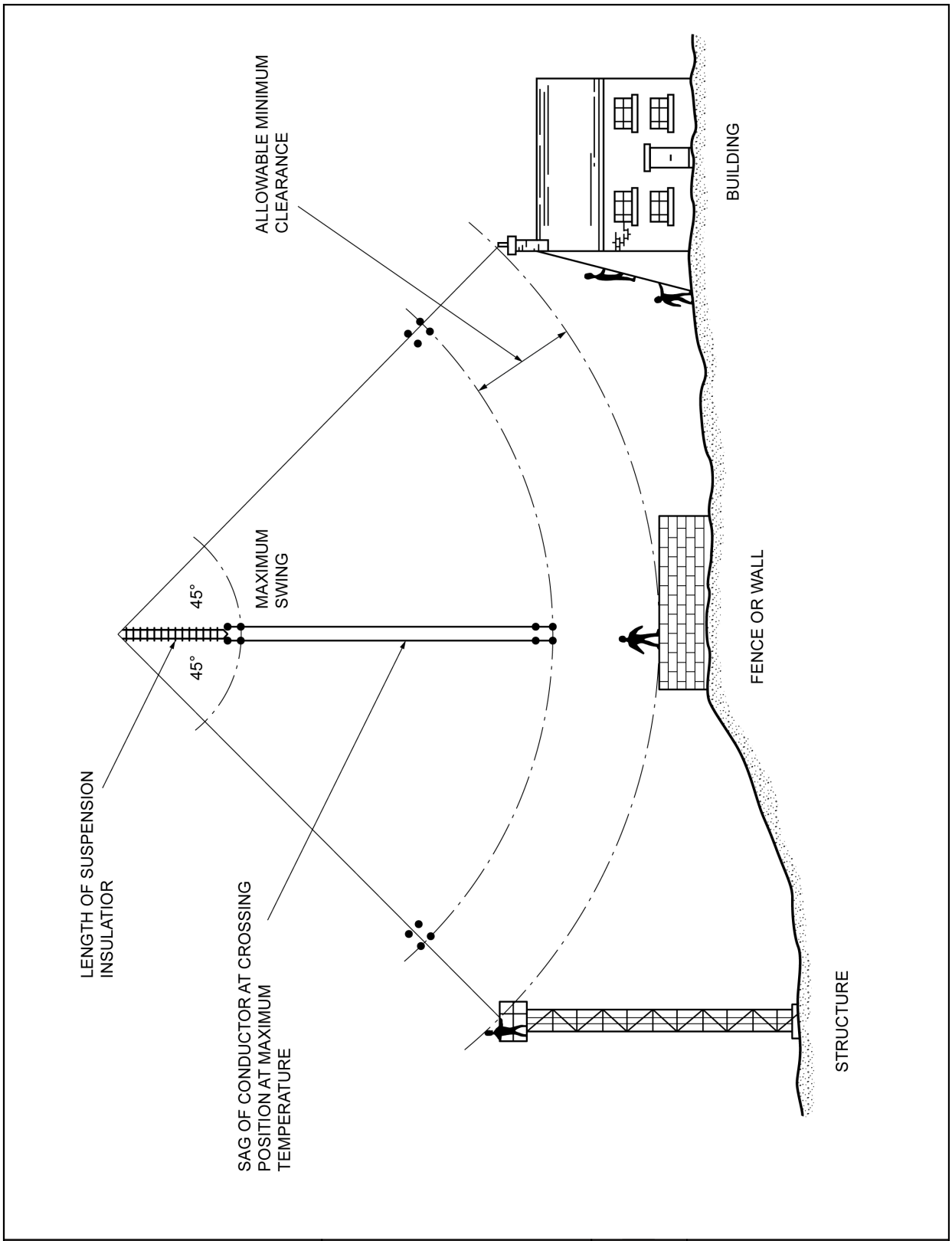
Electricity Safety, Quality and Continuity Regulations 2002.

HSE GS6:	Avoidance of Danger from Overhead Lines.
ENA ER G45:	Notes of guidance for Electricity Boards on the use of Irrigators in the vicinity of Overhead Lines.
ENA ER G55/2:	Safe Tree Working in Proximity to Overhead Electric Lines.
ENA ER L11/4:	Clearance between Lines of the CEGB and other Overhead Power Lines (superseded by ENA TS 43-8).
ENA ER L31:	Railway Wayleave Agreement.
ENA ER L34:	Memorandum on the Electricity (Overhead Lines) Regulations 1970.
ENA ER PO5:	Protection of Telecommunication Lines from Power Lines.
ENA TS 43-2:	Design of Steel Tower Overhead Transmission Lines at 132kV and Higher Voltages.
ENA TS 43-8 Issue 3, 2004:	Overhead Line Clearances.
British Waterways Board: SMCC008, 1996:	Joint Safety Guidelines (Electricity Industry and British Waterways).

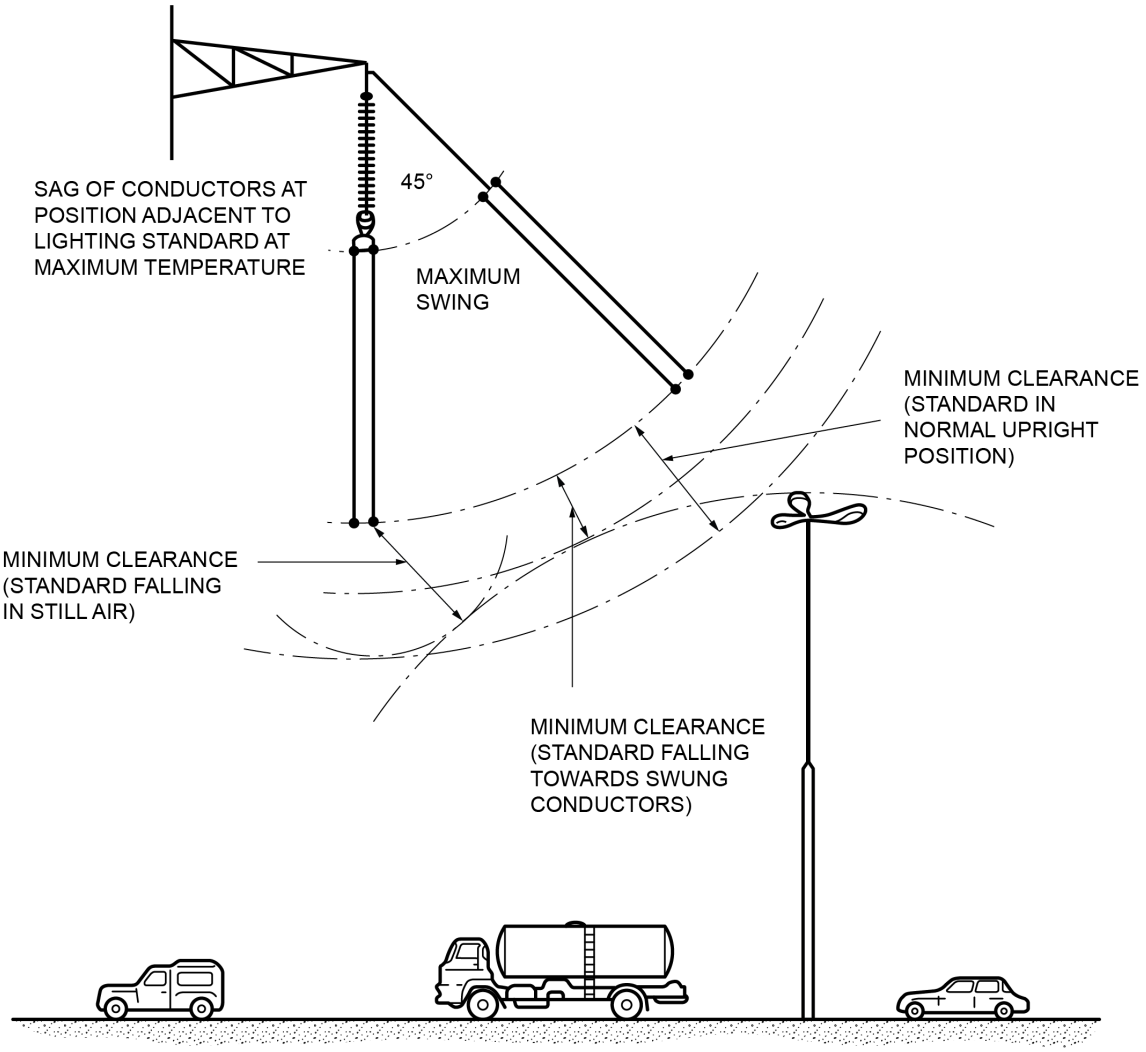
LPG Gas Association: Code of Practice 1:	Bulk LPG Storage at Fixed Installations. Part 1: Design, Installation and Operation of Vessels Located above Ground.
Distribution Safety Rules	
EPD473:	Policy for Overhead Line Standards – Design, Construction, Refurbishment, Selection and Classification.
CP421:	Maintenance and Refurbishment Policy for Wood Pole Lines and Steel Tower Lines up to 132kV.

16. KEYWORDS

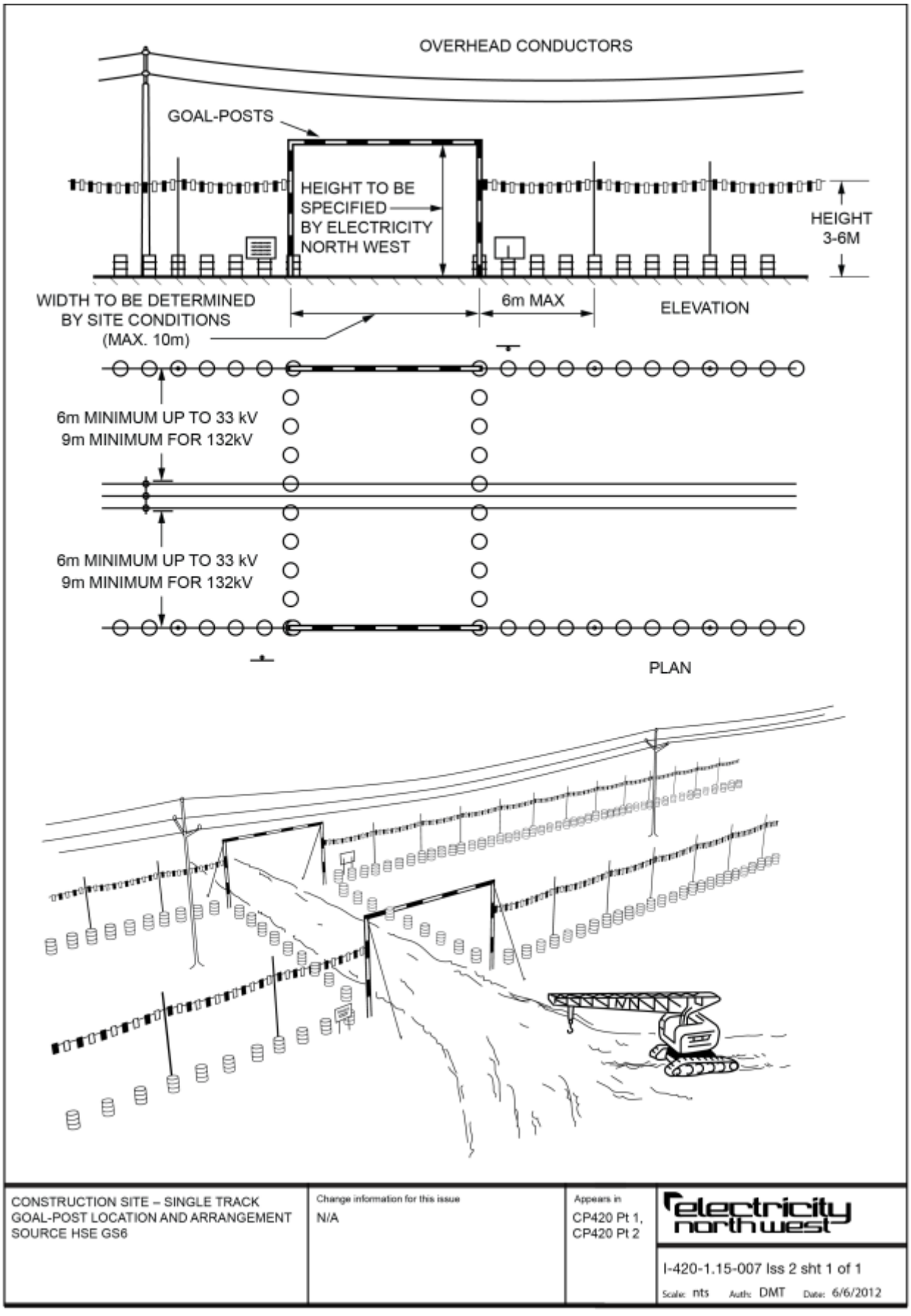
Clearance

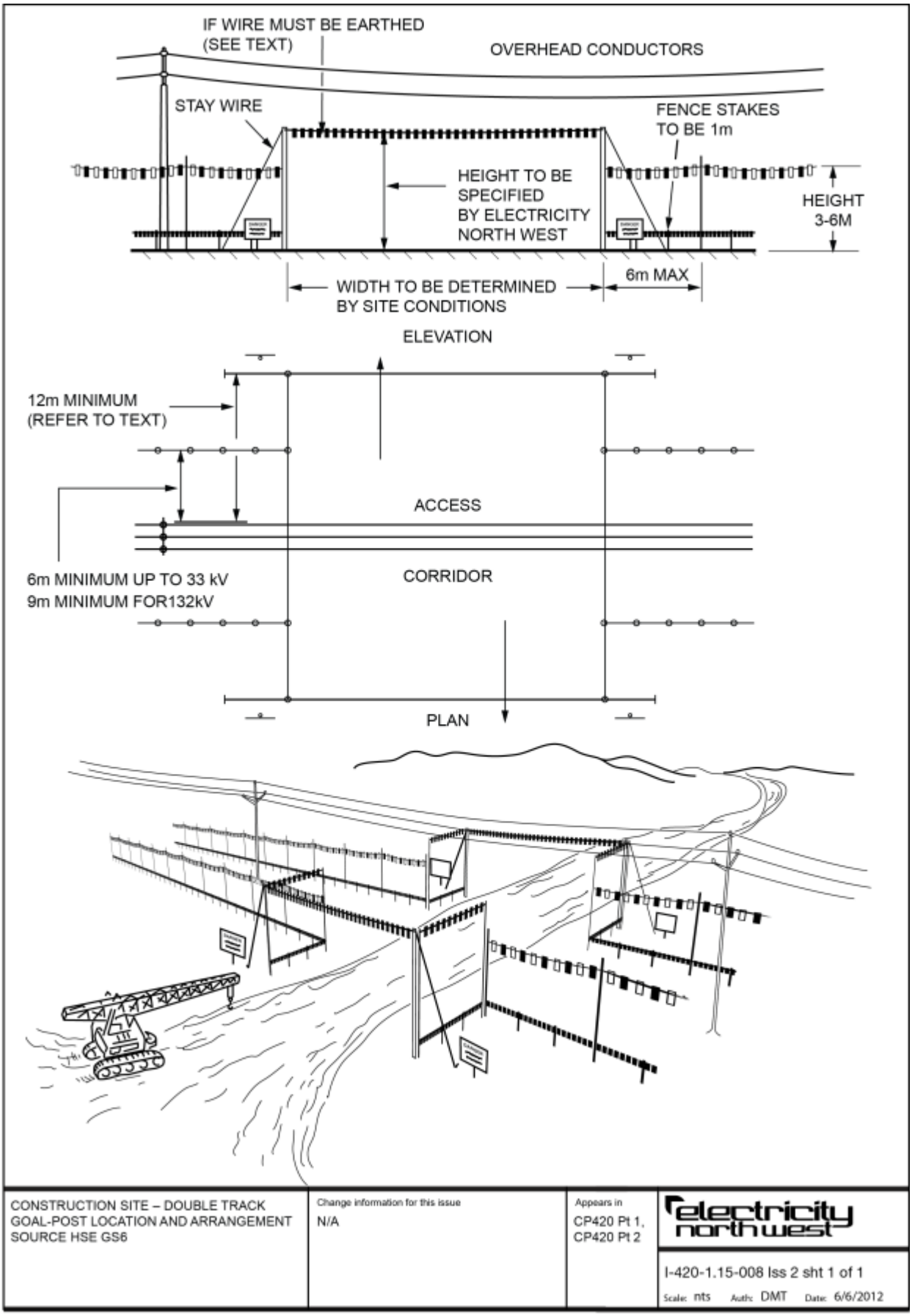


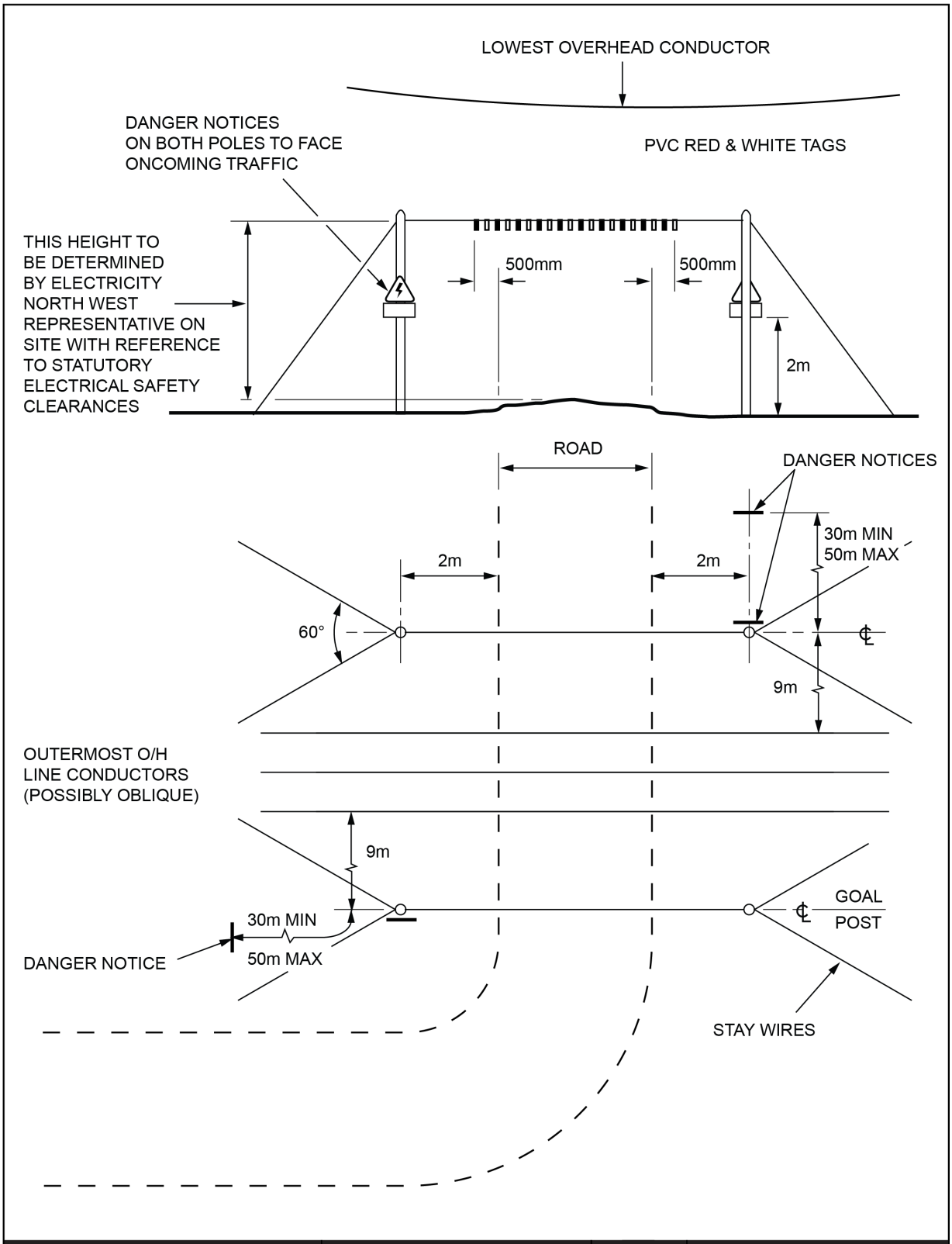
CLEARANCE TO OBJECTS (ON WHICH A PERSON CAN STAND) SOURCE ENATS 43-8	Change information for this issue N/A	Appears in CP420 Pt 1, CP420 Pt 2	electricity north west I-420-1.15-003 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012



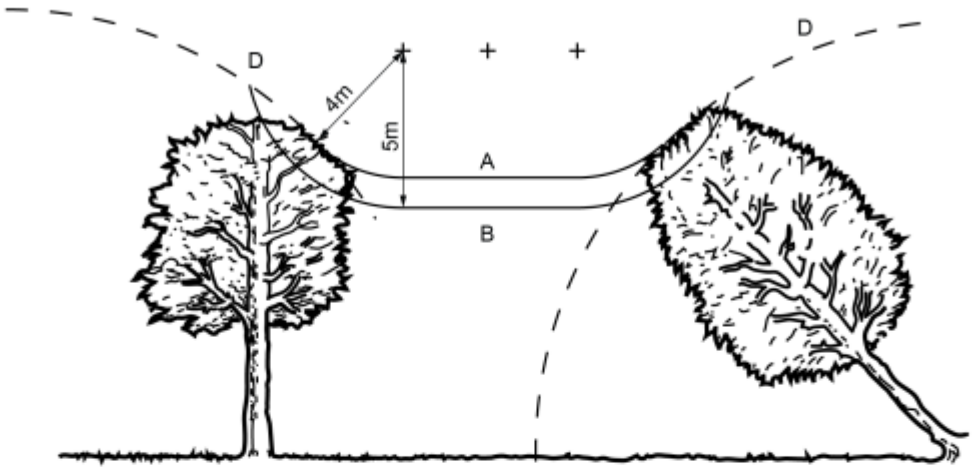
CLEARANCE TO LIGHTING STANDARDS SOURCE ENATS 43-8	Change information for this issue N/A	Appears in CP420 Pt 1, CP420 Pt 2	I-420-1.15-004 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012







FORESTS AND PLANTATIONS GOAL-POST LOCATION AND ARRANGEMENT SOURCE ER G55	Change information for this issue N/A	Appears in CP420 Pt 1, CP420 Pt 2	electricity north west I-420-1.15-013 Iss 2 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012



Notes

1. Line A represents the minimum clearance from a line conductor to tip or slender growth.
2. Line B represents the minimum clearance from a line conductor to any growth which could conceivably be considered capable of supporting a tree climber (other than tree stumps capable of providing a platform)
3. Line D represents the falling distance curve.
4. The distance between any line conductor and the top of any tree stump shall be not less than 6.0m as measured vertically. This clearance applies to tree stumps that are within 2.0m (as measured horizontally) from the closest point of the nearest conductor.
5. Variation of conductor sag due to temperature change should be taken into account for mid span situations.
6. Tree growth in the vicinity of towers shall not be allowed to nullify the effectiveness of anti-climbing guards.
7. Extent of cut back to be obtained beyond minimum clearances to be determined locally.

RECOMMENDED MINIMUM TREE CLEARANCES 132kV TOWER LINES	Change information for this issue N/A	Appears in CP420 Pt 2	electricity north west I-420-2.15-001 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

ATTACHMENT A: SAFE CLIMBING CLEARANCES

Note:

Swing caused by wind on the conductors is not considered in the attached drawings. An on site assessment in accordance with Distribution Safety Rule Approved Procedure No 30 shall be done prior to commencement of climbing. In certain situations personal supervision by the Senior Authorised Person is required.

A1 SAFE CLIMBING CLEARANCES FOR L2 TYPE TOWERS

I-420-2.15A1-001	Safe Climbing Diagram for L2 D Type Tower, 132kV, Single Conductor
I-420-2.15A1-002	Safe Climbing Diagram for L2 D10 Type Tower, 132kV, Single Conductor
I-420-2.15A1-003	Safe Climbing Diagram for L2 D30 Type Tower, 132kV, Single Conductor
I-420-2.15A1-004	Safe Climbing Diagram for L2 D60 Type Tower, 132kV, Single Conductor
I-420-2.15A1-005	Safe Climbing Diagram for L2 D90 Type Tower, 132kV, Single Conductor
I-420-2.15A1-006	Safe Climbing Diagram for L2 D Type Tower, 275kV, Single Conductor - operating at 132kV
I-420-2.15A1-007	Safe Climbing Diagram for L2 D10 Type Tower, 275kV, Single Conductor - operating at 132kV
I-420-2.15A1-008	Safe Climbing Diagram for L2 D30 Type Tower, 275kV, Single Conductor - operating at 132kV
I-420-2.15A1-009	Safe Climbing Diagram for L2 D60 Type Tower, 275kV, Single Conductor - operating at 132kV
I-420-2.15A1-010	Safe Climbing Diagram for L2 D90 Type Tower, 275kV, Single Conductor - operating at 132kV
I-420-2.15A1-011	Safe Climbing Diagram for L2 D Type Tower, 400kV, Single Conductor - operating at 132kV
I-420-2.15A1-012	Safe Climbing Diagram for L2 D10 Type Tower, 400kV, Single Conductor - operating at 132kV
I-420-2.15A1-013	Safe Climbing Diagram for L2 D30 Type Tower, 400kV, Single Conductor - operating at 132kV
I-420-2.15A1-014	Safe Climbing Diagram for L2 D60 Type Tower, 400kV, Single Conductor - operating at 132kV
I-420-2.15A1-015	Safe Climbing Diagram for L2 D90 Type Tower, 400kV, Single Conductor - operating at 132kV
I-420-2.15A1-016	Safe Climbing Diagram for L2 DT Type Tower

A2 SAFE CLIMBING CLEARANCES FOR L3 TYPE TOWERS

I-420-2.15A2-001 Safe Climbing Diagram for L3 DS Type Tower, 132kV, Single Conductor

I-420-2.15A2-002 Safe Climbing Diagram for L3 D Type Tower, 132kV, Single Conductor Arrangement

I-420-2.15A2-003 Safe Climbing Diagram for L3 D10 Type Tower, 132kV, Single Conductor Arrangement

I-420-2.15A2-004 Safe Climbing Diagram for L3 D30 Type Tower, 132kV, Single Conductor Arrangement

I-420-2.15A2-005 Safe Climbing Diagram for L3 D60 Type Tower, 132kV, Single Conductor Arrangement

I-420-2.15A2-006 Safe Climbing Diagram for L3 DS Type Tower, 275kV, Single Conductor - operating at 132kV

I-420-2.15A2-007 Safe Climbing Diagram for L3 D Type Tower, 275kV, Single Conductor Arrangement

I-420-2.15A2-008 Safe Climbing Diagram for L3 D10 Type Tower, 275kV, Single Conductor Arrangement

I-420-2.15A2-009 Safe Climbing Diagram for L3 D30 Type Tower, 275kV, Single Conductor Arrangement

I-420-2.15A2-010 Safe Climbing Diagram for L3 D60 Type Tower, 275kV, Single Conductor Arrangement

I-420-2.15A2-011 Safe Climbing Diagram for L3 DT Type Tower

A3 SAFE CLIMBING CLEARANCES FOR L4 TYPE TOWERS

I-420-2.15A3-001 Safe Climbing Diagram for L4m D Type Tower, 132kV Arrangement

I-420-2.15A3-002 Safe Climbing Diagram for L4m D30 Type Tower, 132kV Arrangement

I-420-2.15A3-003 Safe Climbing Diagram for L4m D60 Type Tower, 132kV Arrangement

I-420-2.15A3-004 Safe Climbing Diagram for L4m D90 Type Tower, 132kV Arrangement

I-420-2.15A3-005 Safe Climbing Diagram for L4m DT Type Tower, 132kV Arrangement

A4 SAFE CLIMBING CLEARANCES FOR L7 TYPE TOWERS

I-420-2.15A4-001 Safe Climbing Diagram for L7 D Type Tower, 132kV, Single Conductor

I-420-2.15A4-002 Safe Climbing Diagram for L7 D30 Type Tower, 132kV, Single Conductor

I-420-2.15A4-003 Safe Climbing Diagram for L7 D60 Type Tower, 132kV, Single Conductor

I-420-2.15A4-004 Safe Climbing Diagram for L7 D90 Type Tower, 132kV, Single Conductor

I-420-2.15A4-005 Safe Climbing Diagram for L7 DT Type Tower, 132kV, Single Conductor

A5 SAFE CLIMBING CLEARANCES FOR PL1 TYPE TOWERS

I-420-2.15A5-001 Safe Climbing Diagram for NWE PL1 D2 Type Tower, 132kV Arrangement

I-420-2.15A5-002 Safe Climbing Diagram for NWE PL1 D10 Type Tower, 132kV Arrangement

I-420-2.15A5-003 Safe Climbing Diagram for NWE PL1 D30 Type Tower, 132kV Arrangement

I-420-2.15A5-004 Safe Climbing Diagram for NWE PL1 D60 Type Tower, 132kV Arrangement

I-420-2.15A5-005 Safe Climbing Diagram for NWE PL1 D90 Type Tower, 132kV Arrangement

I-420-2.15A5-006 Safe Climbing Diagram for NWE PL1 DT Type Tower

I-420-2.15A5-007 Safe Climbing Diagram for NWE PL1 S2 Type Tower, 132kV Arrangement

I-420-2.15A5-008 Safe Climbing Diagram for NWE PL1 S10 Type Tower, 132kV Arrangement

I-420-2.15A5-009 Safe Climbing Diagram for NWE PL1 S30 Type Tower, 132kV Arrangement

I-420-2.15A5-010 Safe Climbing Diagram for NWE PL1 S60 Type Tower, 132kV Arrangement

I-420-2.15A5-011 Safe Climbing Diagram for NWE PL1 S90 Type Tower, 132kV Arrangement

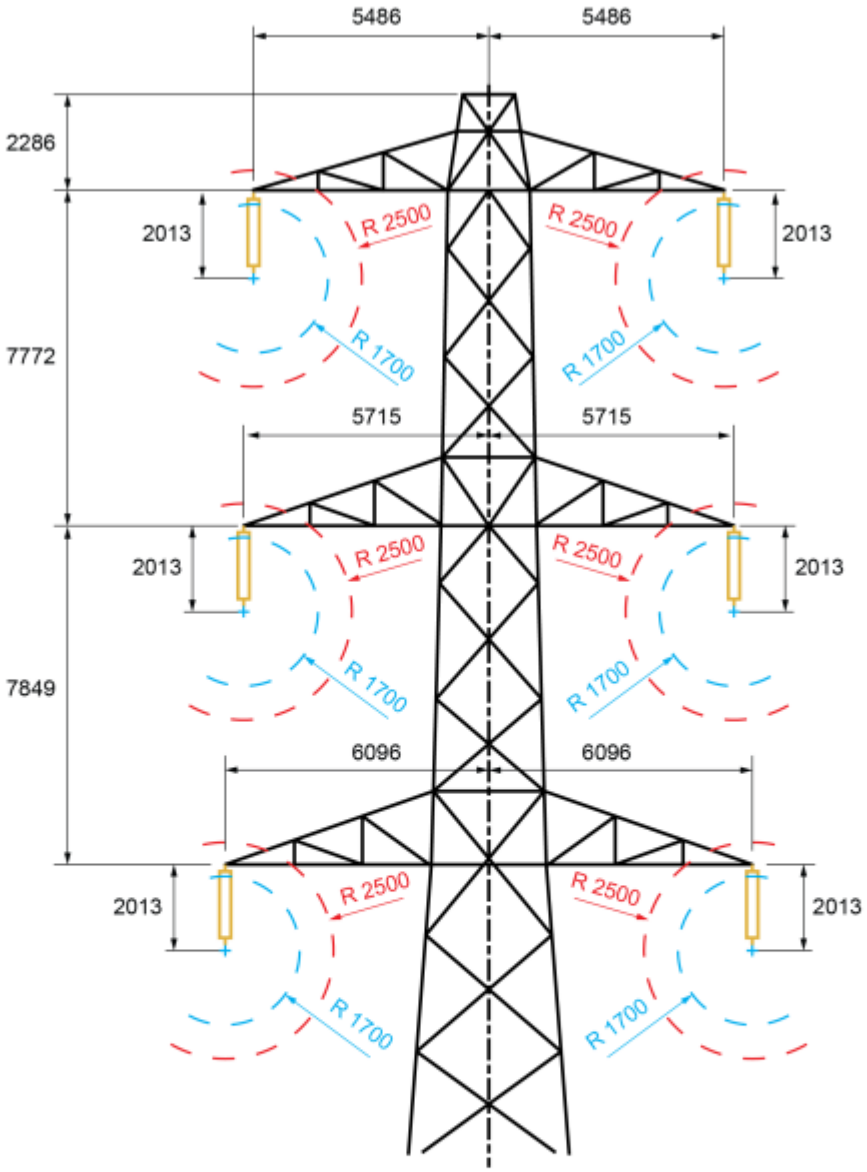
I-420-2.15A5-012 Safe Climbing Diagram for NWE PL1 ST Type Tower

A6 SAFE CLIMBING CLEARANCES FOR PL16 TYPE TOWERS

I-420-2.15A6-001	Safe Climbing Diagram for PL16 D2 and D2S Type Towers, 132kV Arrangement
I-420-2.15A6-002	Safe Climbing Diagram for PL16 D10 Type Tower, 132kV Arrangement
I-420-2.15A6-003	Safe Climbing Diagram for PL16 D30 Type Tower, 132kV Arrangement
I-420-2.15A6-004	Safe Climbing Diagram for PL16 D60 Type Tower, 132kV Arrangement
I-420-2.15A6-005	Safe Climbing Diagram for PL16 D90 Type Tower, 132kV Arrangement
I-420-2.15A6-006	Safe Climbing Diagram for PL16 DT Type Tower, 132kV Arrangement

A7 SAFE CLIMBING CLEARANCES FOR PL7 TYPE TOWERS

I-420-2.15A7-001	Safe Climbing Diagram for PL7 D2 Type Towers, 132kV Arrangement	10/03/17



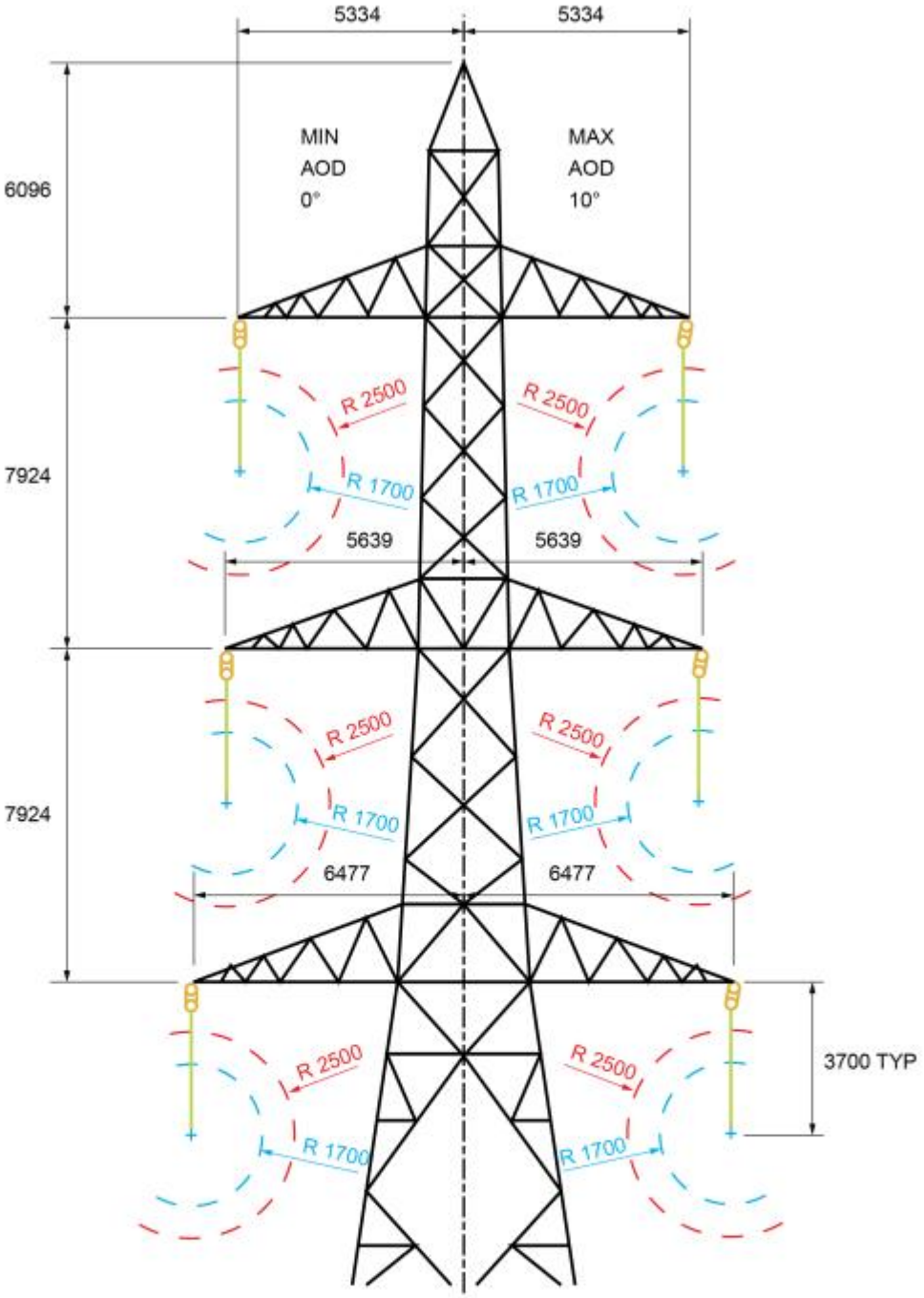
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:

This drawing is a copy of original CAD Drawing UU/L2SCD/01

SAFE CLIMBING DIAGRAM FOR L2 D TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A1-001 Iss 2 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

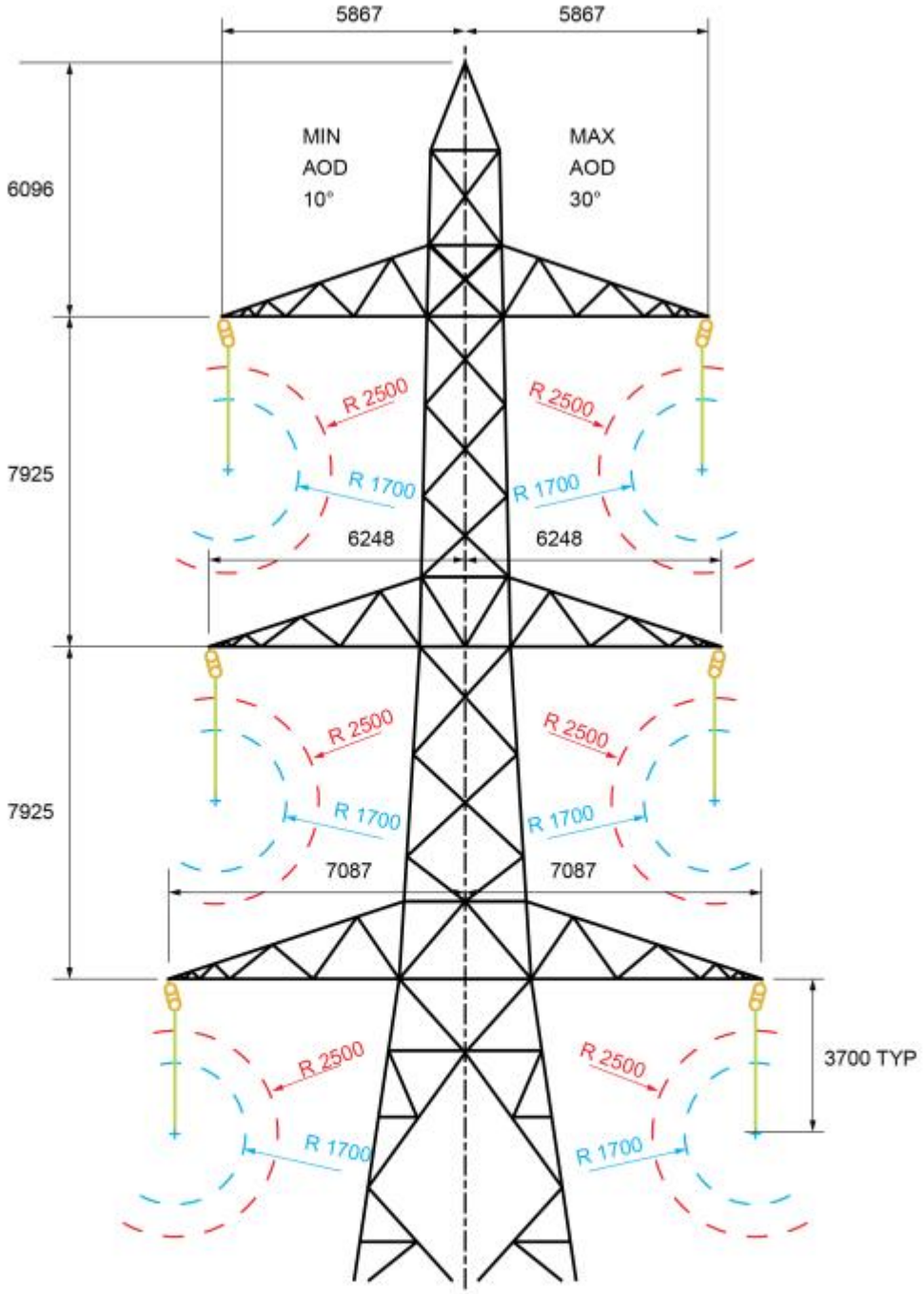


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/02

SAFE CLIMBING DIAGRAM FOR L2 D10 TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A1-002 Iss 2 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

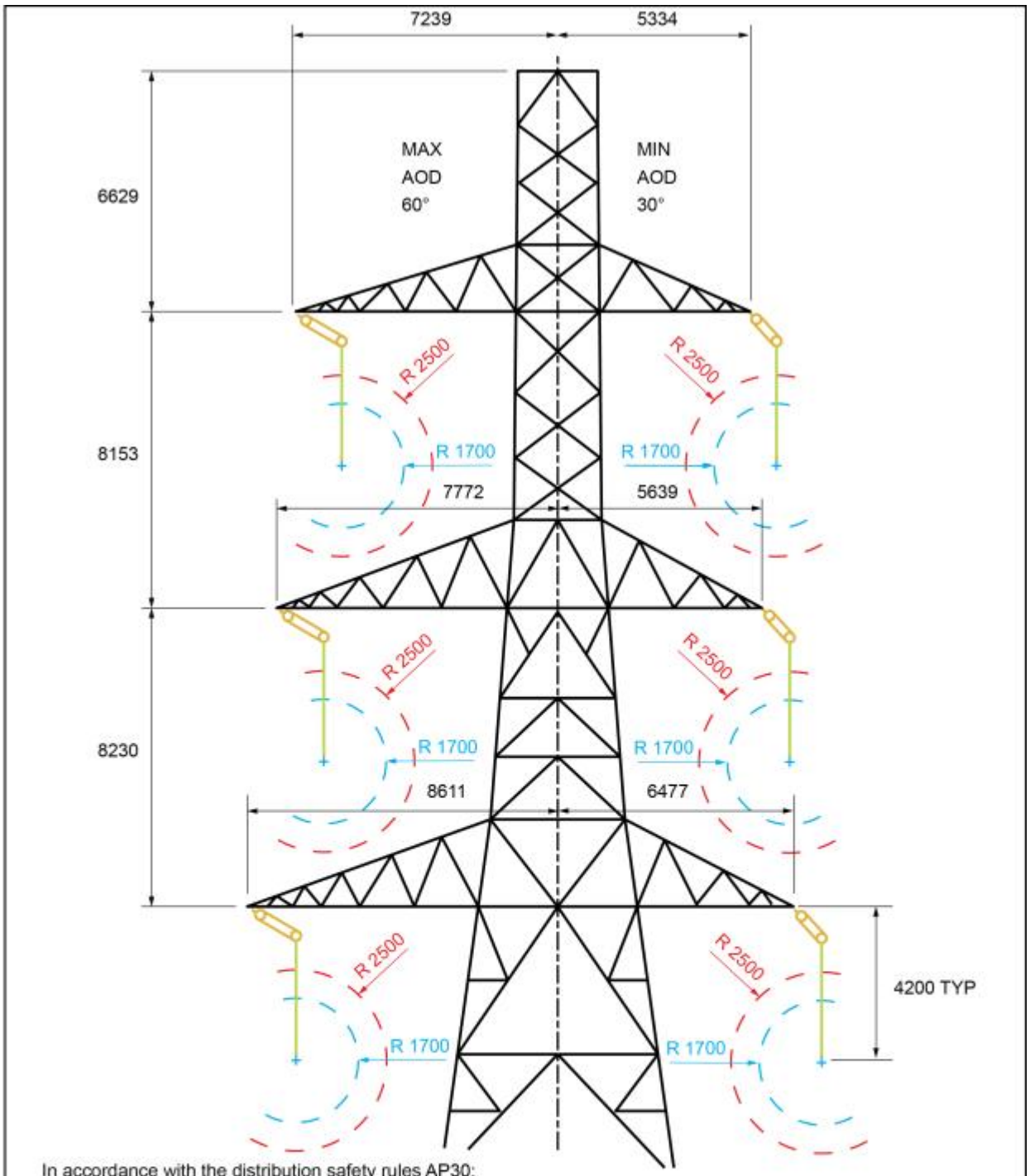


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/03

SAFE CLIMBING DIAGRAM FOR L2 D30 TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A1-003 Iss 2 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

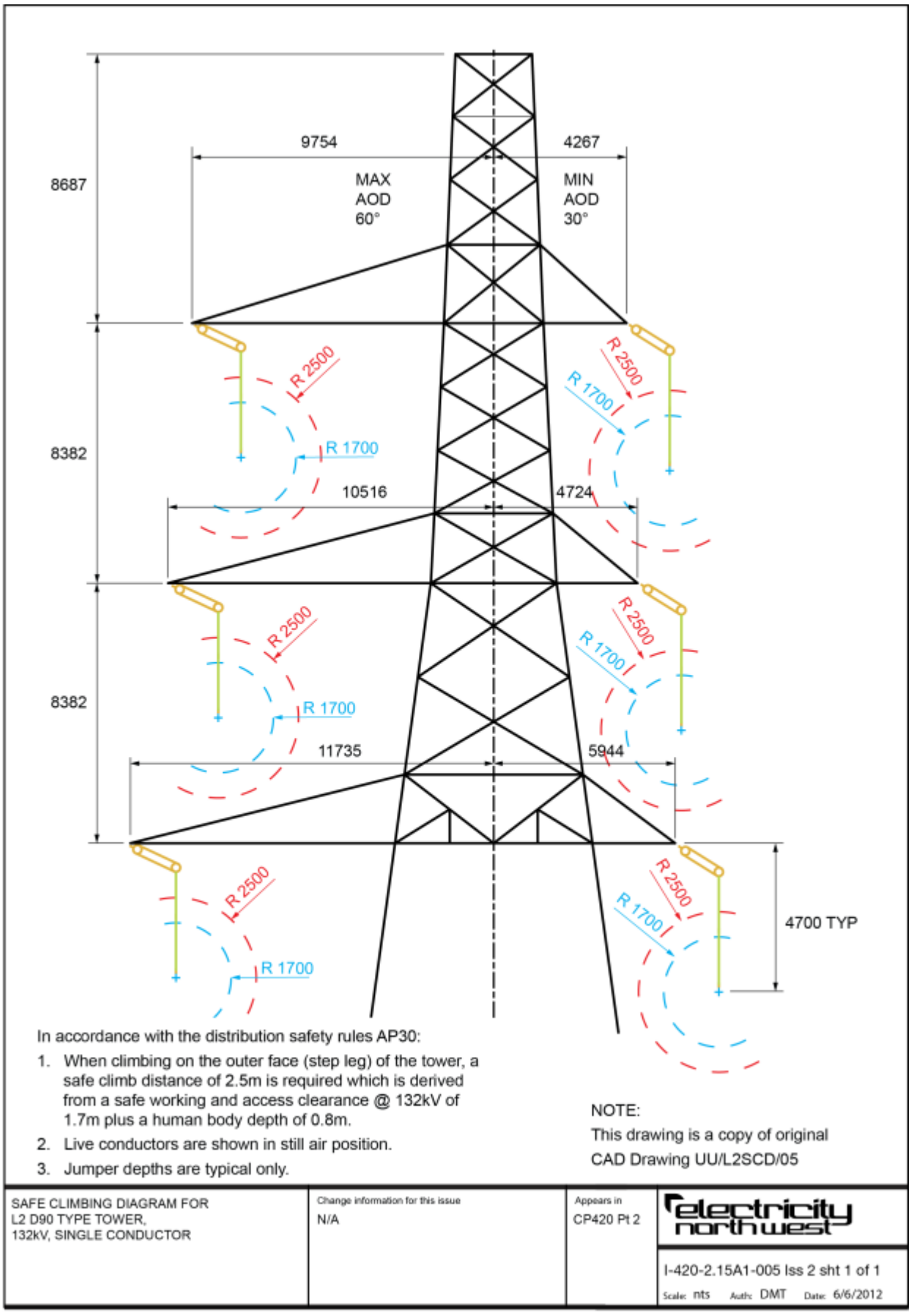


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/04

SAFE CLIMBING DIAGRAM FOR L2 D60 TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A1-004 Iss 2 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

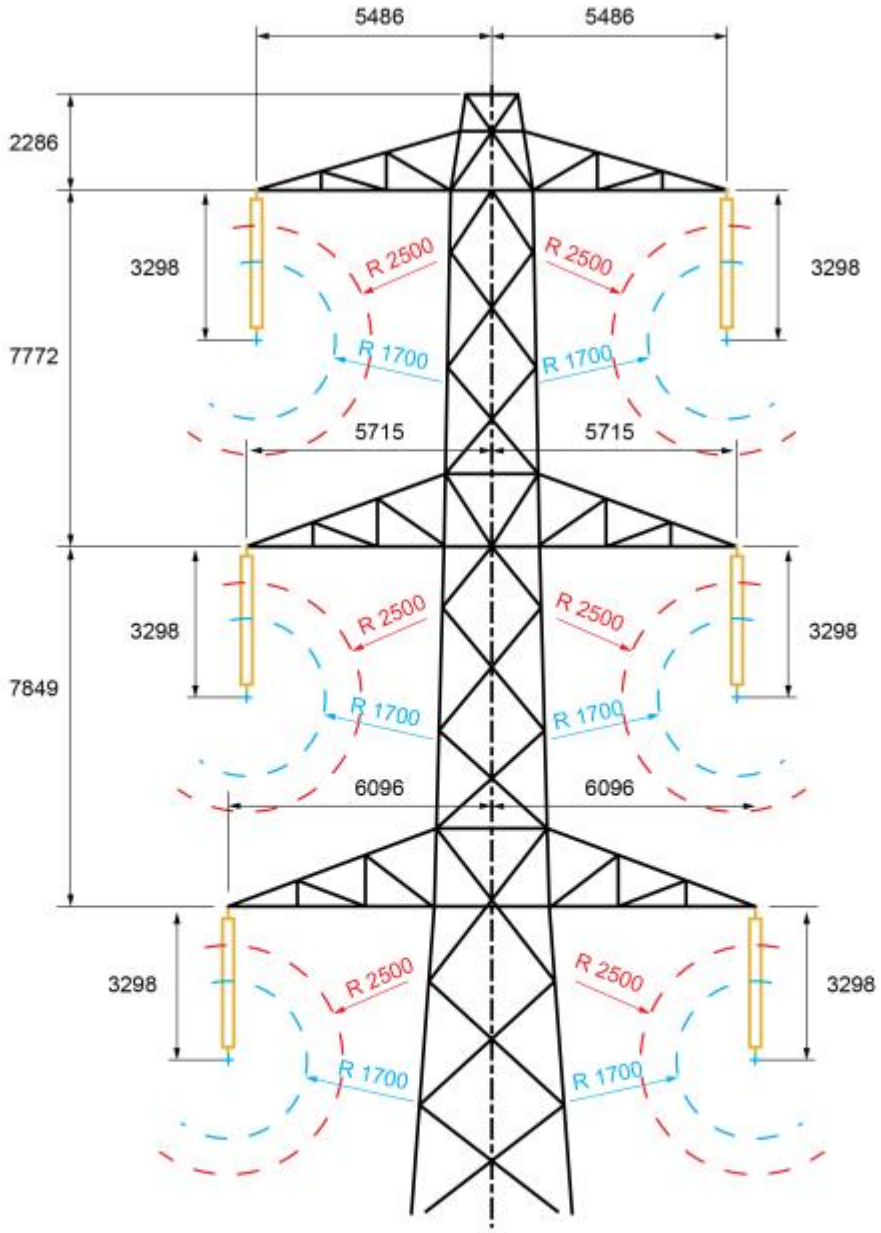


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/05

SAFE CLIMBING DIAGRAM FOR L2 D90 TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A1-005 Iss 2 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012



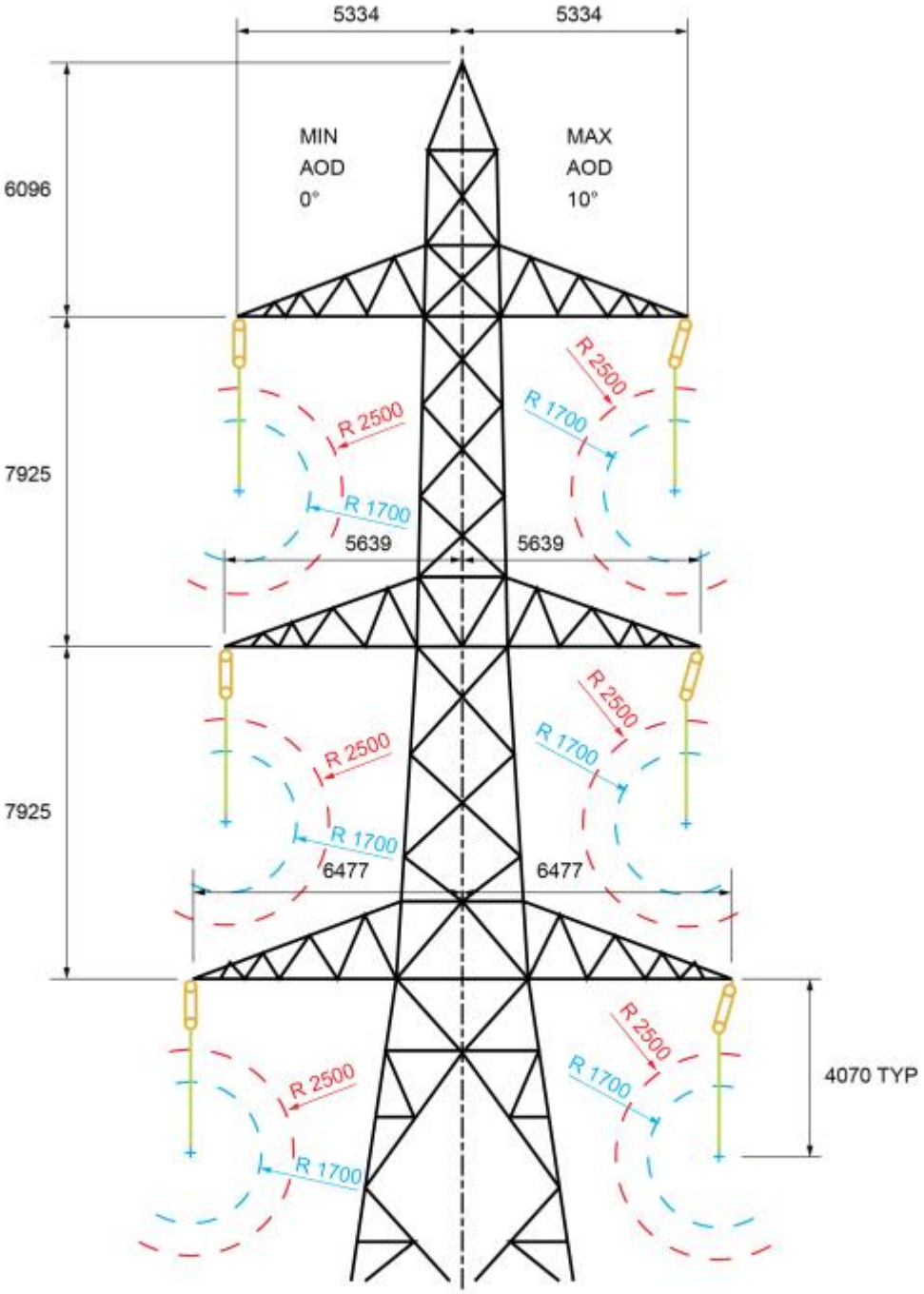
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:

This drawing is a copy of original CAD Drawing UU/L2SCD/06

SAFE CLIMBING DIAGRAM FOR L2 D TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue N/A	Appears in CP420 Pt 2	electricity north west I-420-2.15A1-006 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

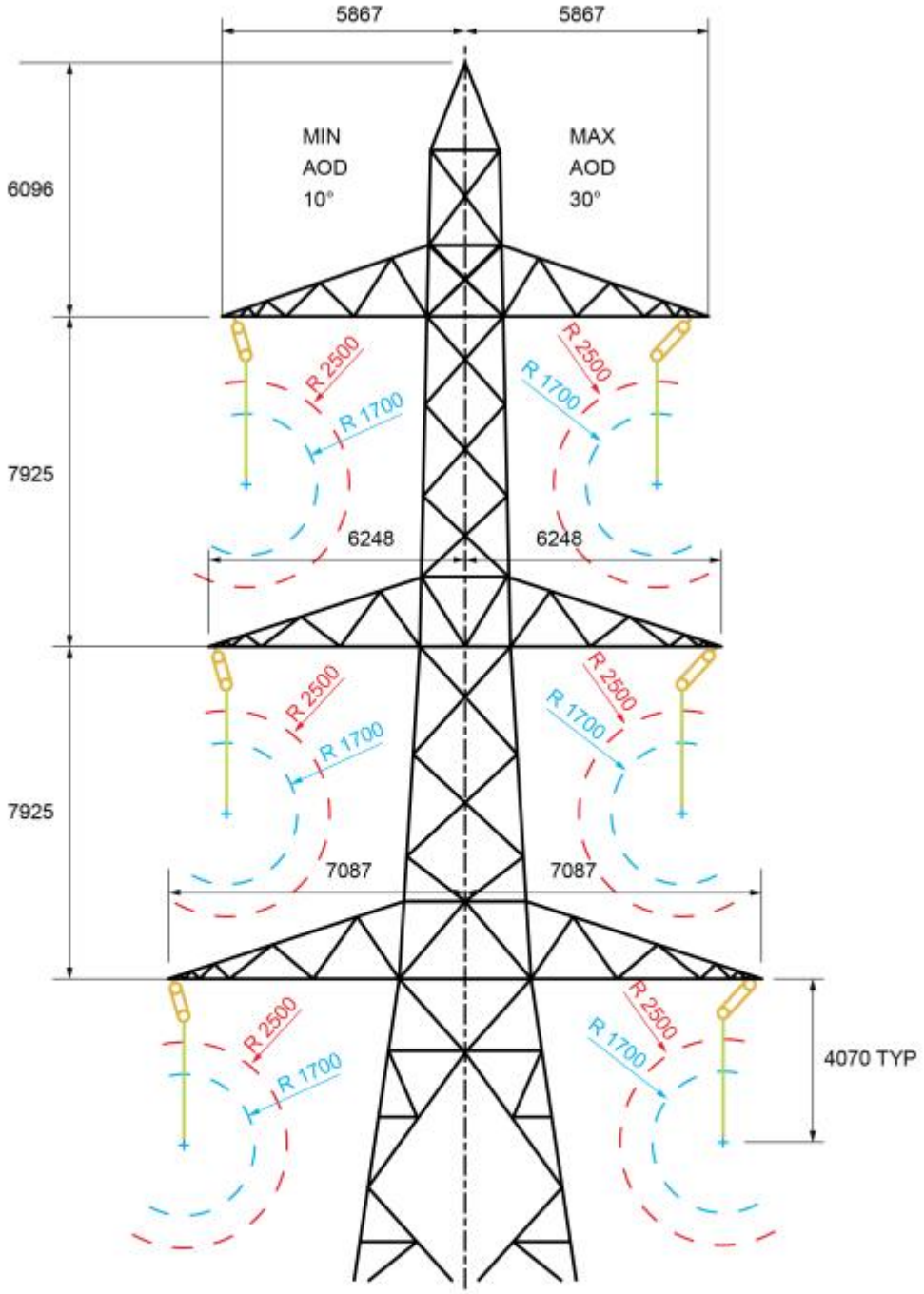


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/07

SAFE CLIMBING DIAGRAM FOR L2 D10 TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A1-007 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

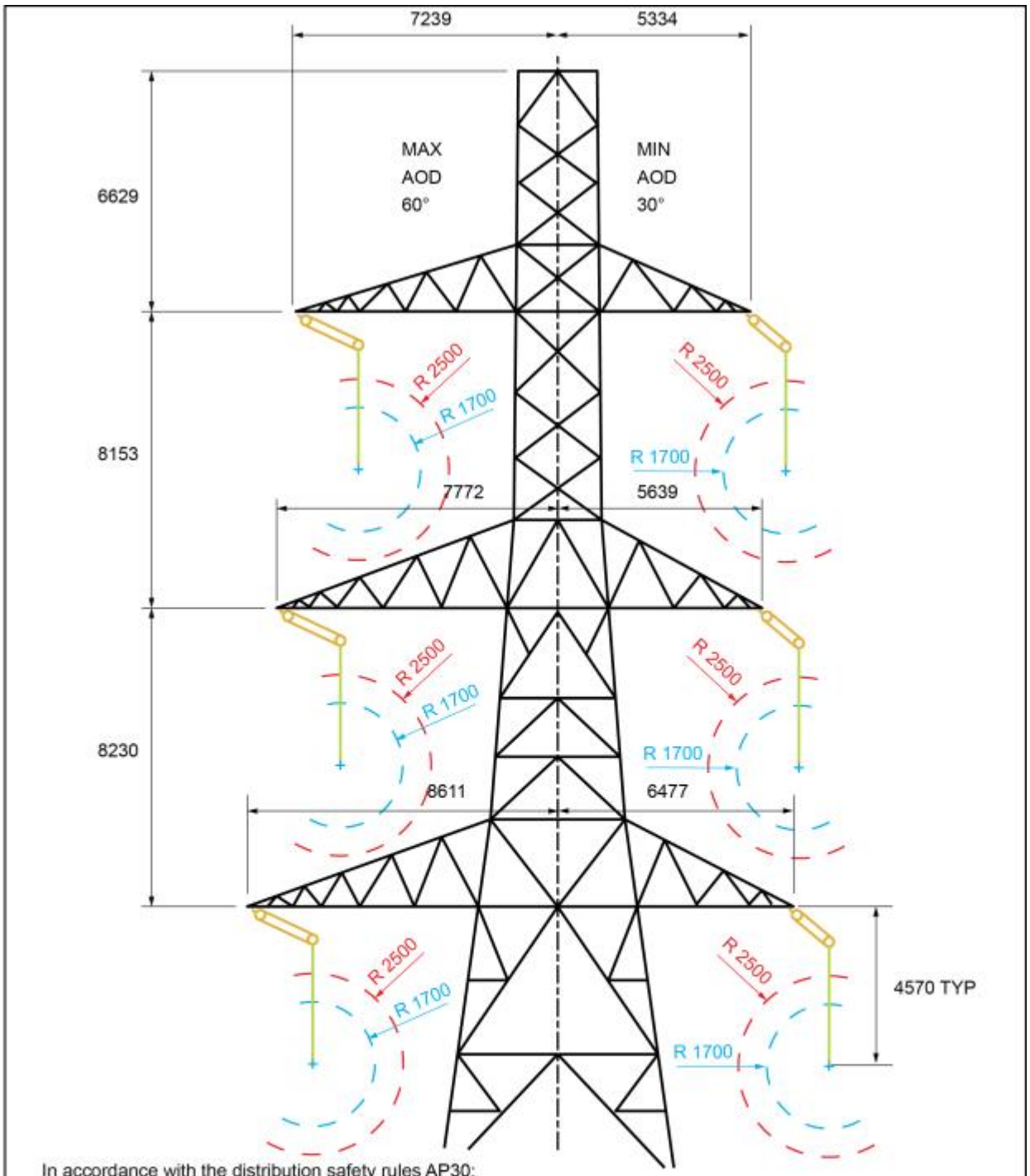


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/08

SAFE CLIMBING DIAGRAM FOR L2 D30 TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A1-008 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

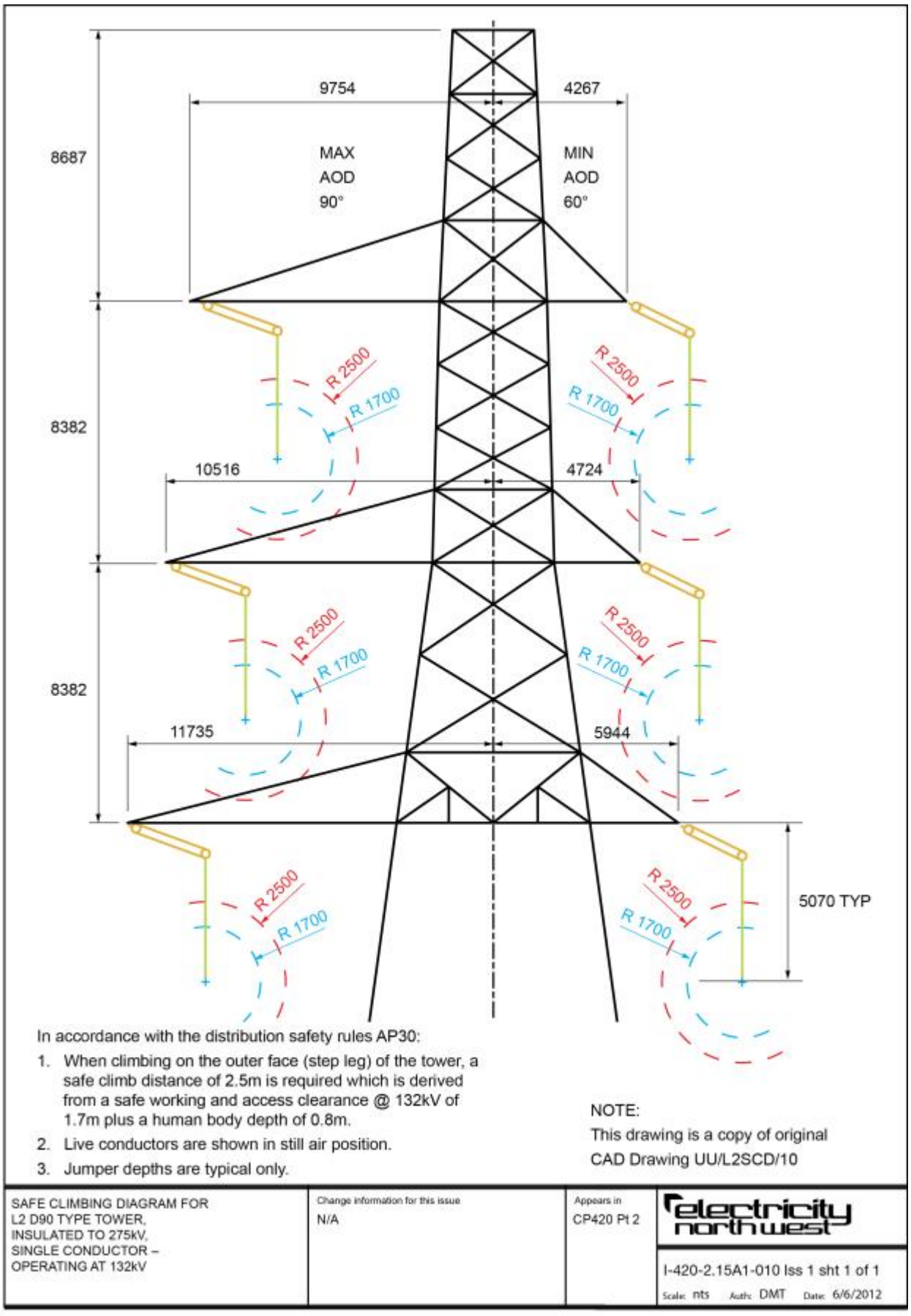


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/09

SAFE CLIMBING DIAGRAM FOR L2 D60 TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A1-009 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

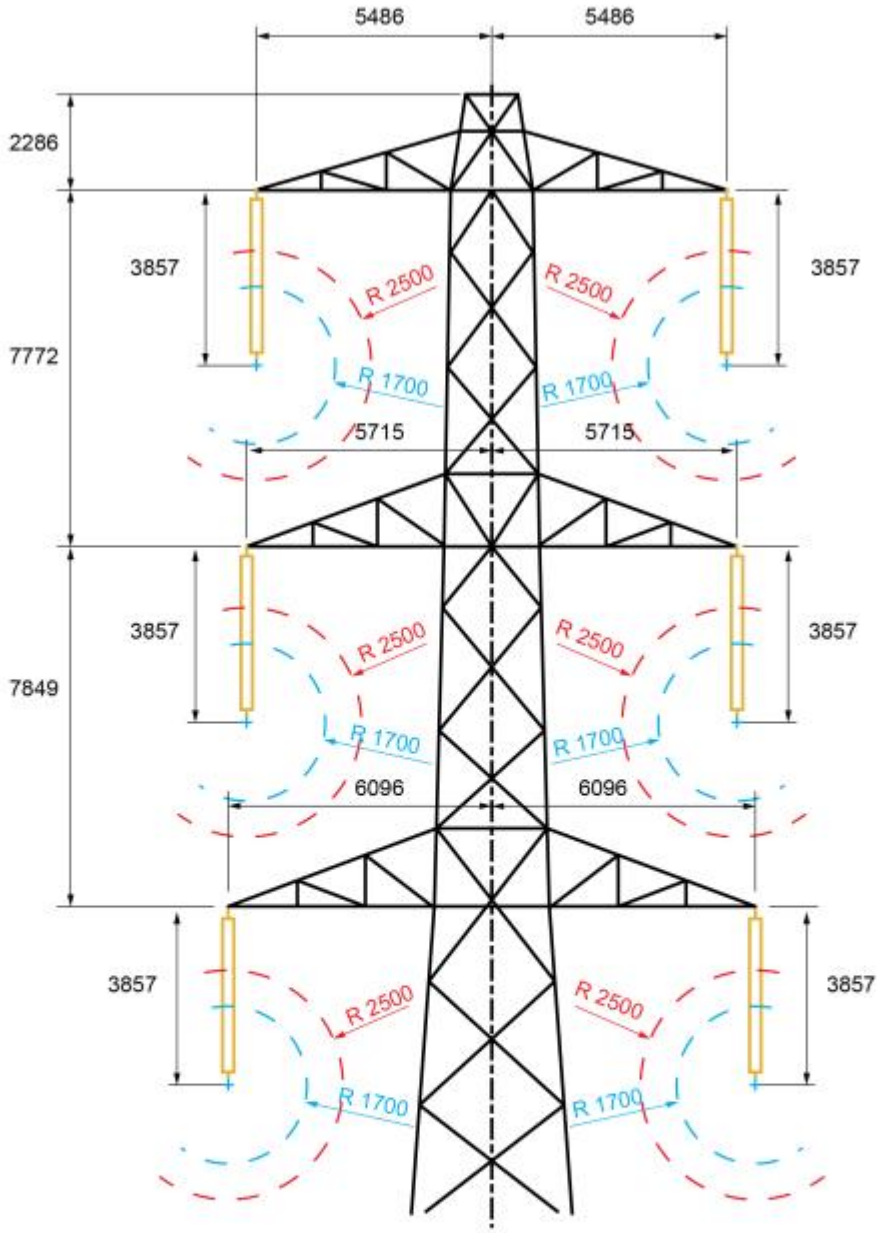


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/10

SAFE CLIMBING DIAGRAM FOR L2 D90 TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A1-010 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012



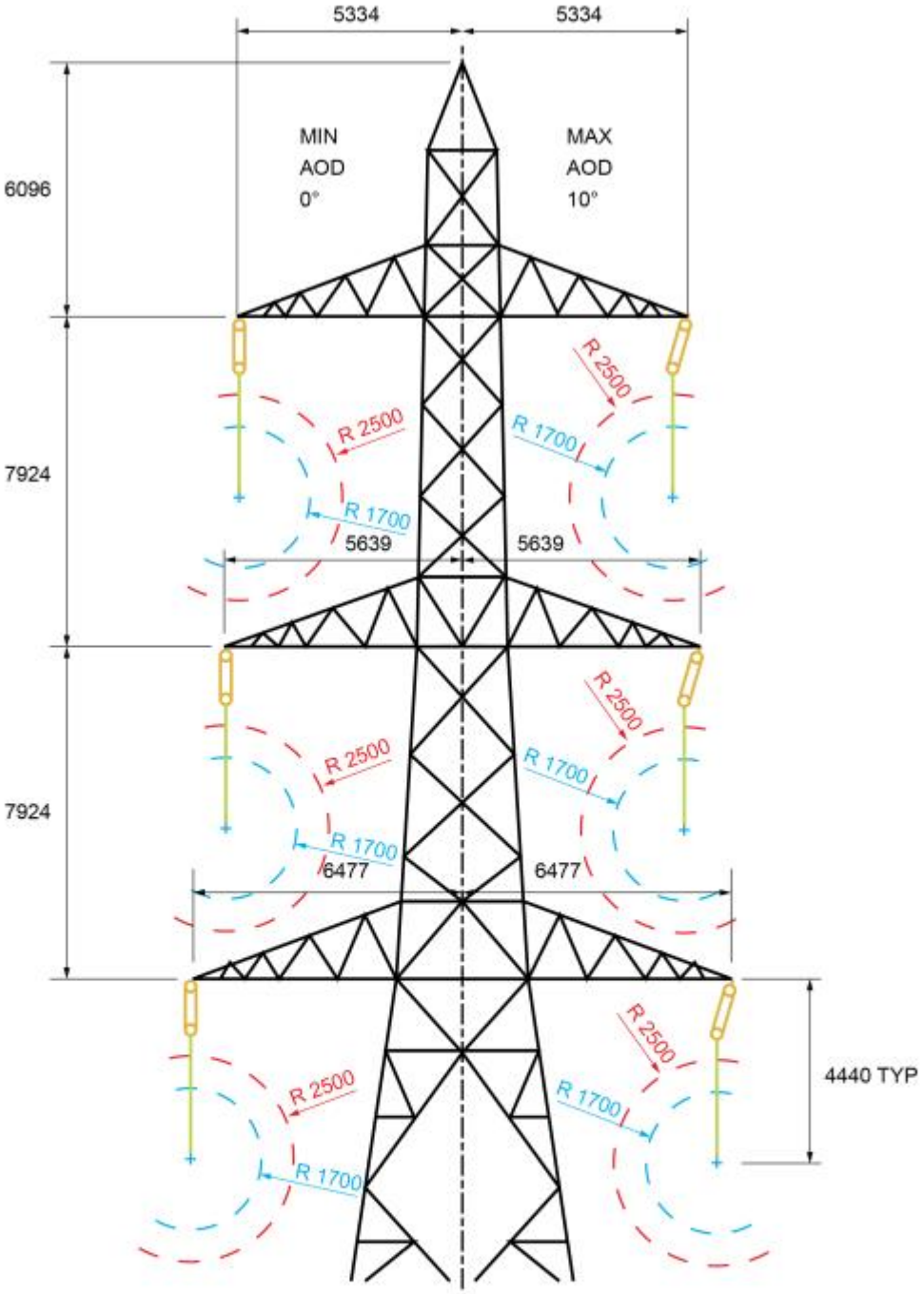
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:

This drawing is a copy of original CAD Drawing UU/L2SCD/11

SAFE CLIMBING DIAGRAM FOR L2 D TYPE TOWER, INSULATED TO 400kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A1-011 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

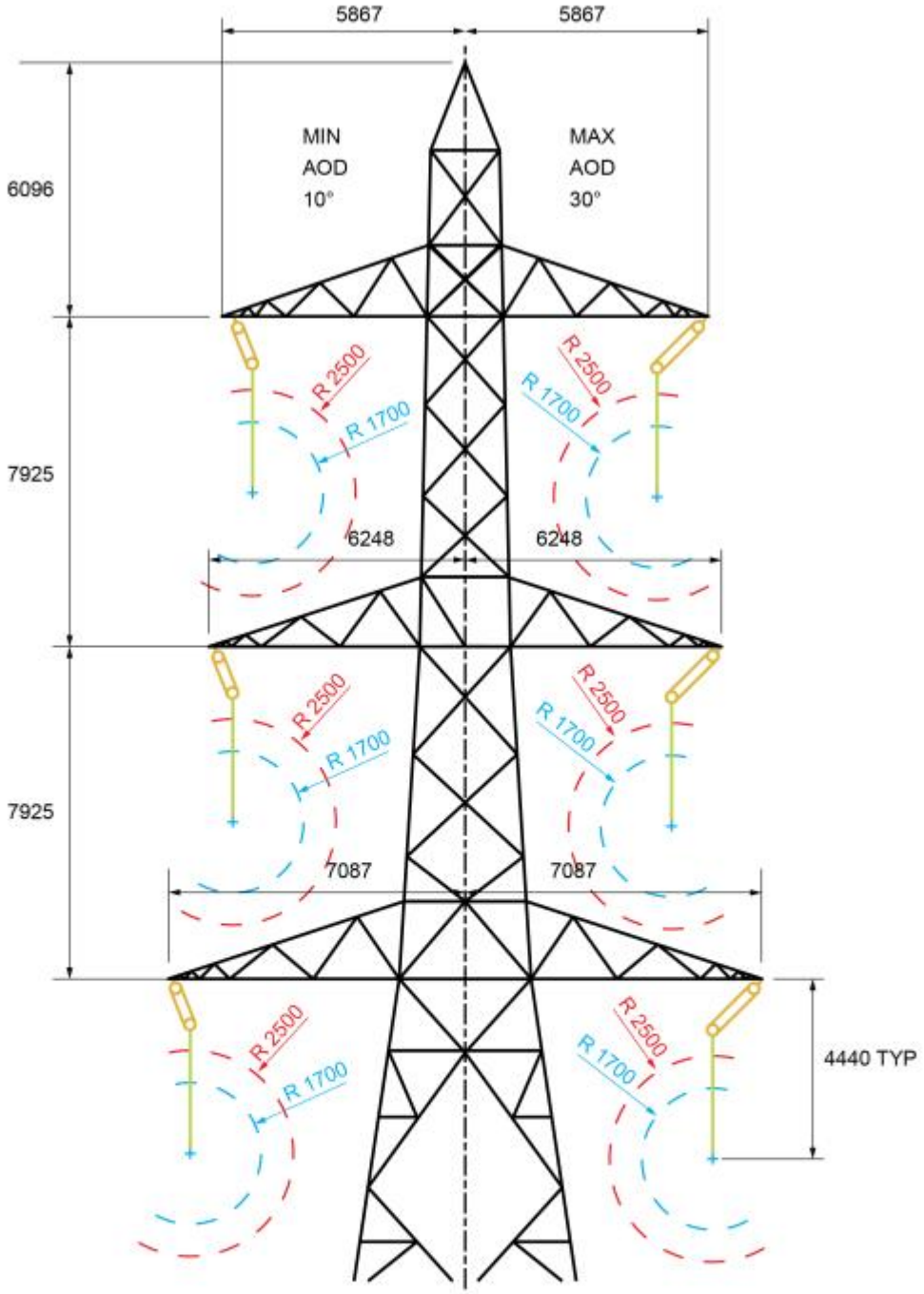


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/12

SAFE CLIMBING DIAGRAM FOR L2 D10 TYPE TOWER, INSULATED TO 400kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A1-012 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

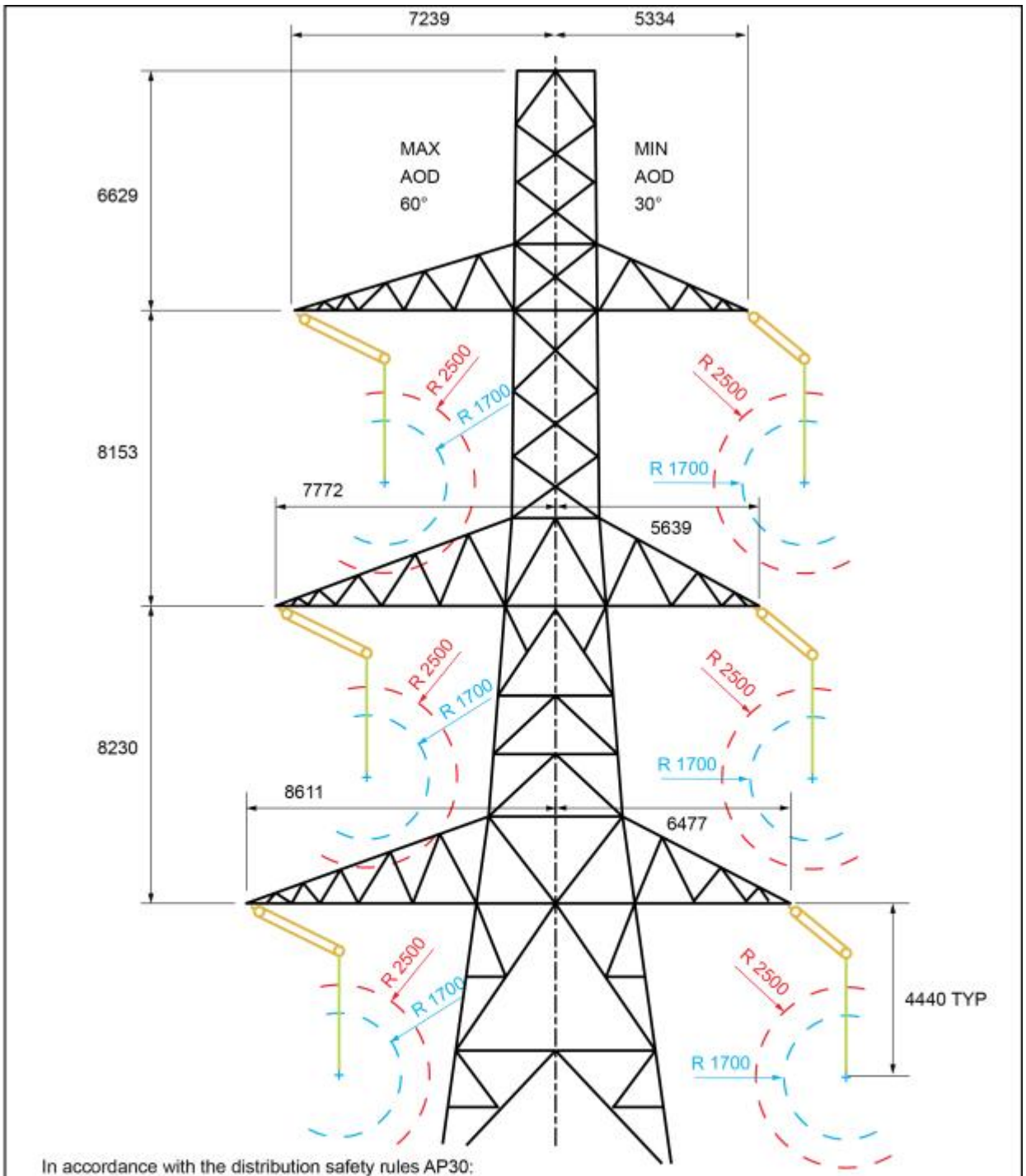


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/13

SAFE CLIMBING DIAGRAM FOR L2 D30 TYPE TOWER, INSULATED TO 400kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue N/A	Appears in CP420 Pt 2	electricity north west I-420-2.15A1-013 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

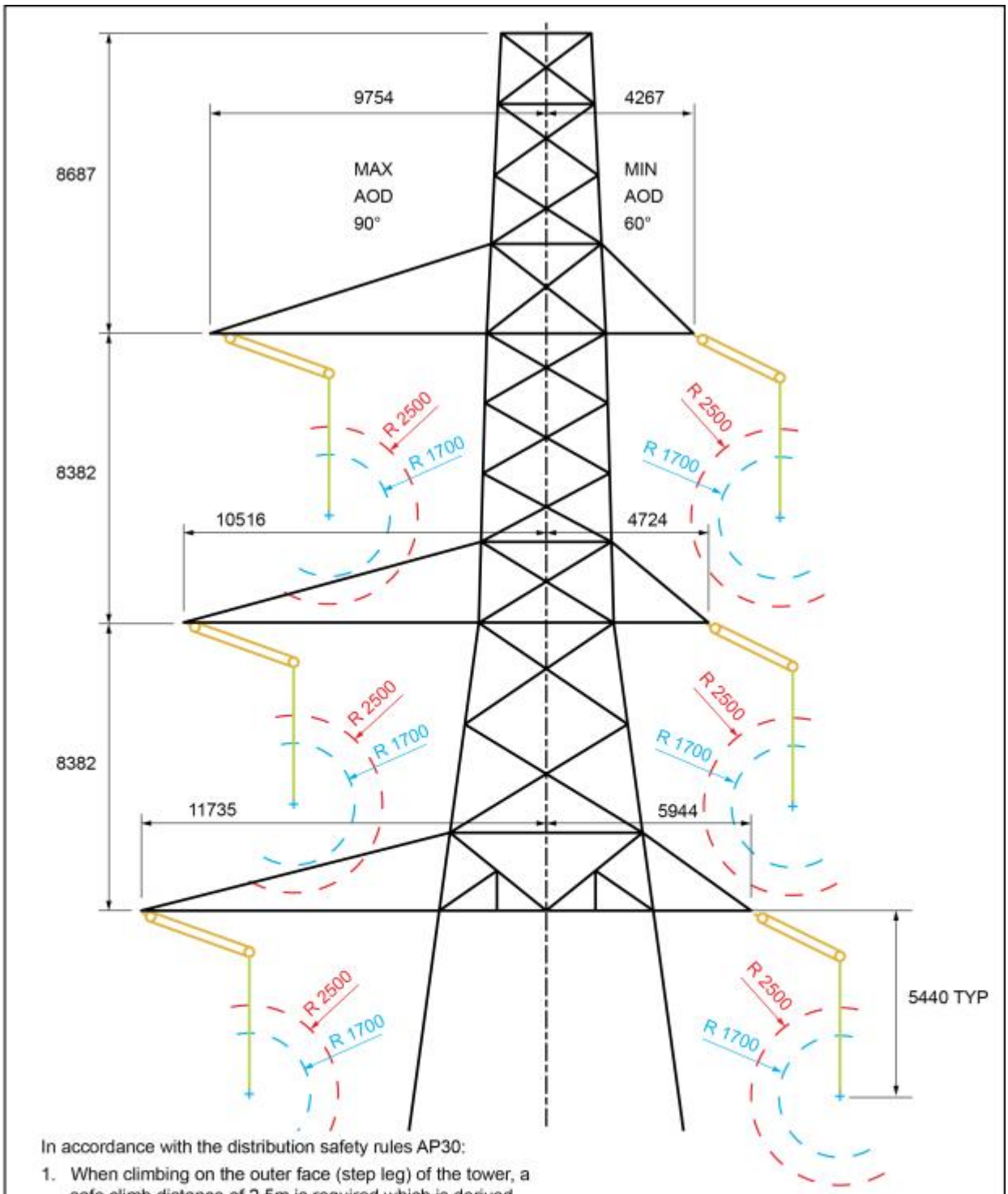


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/14

SAFE CLIMBING DIAGRAM FOR L2 D60 TYPE TOWER, INSULATED TO 400kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A1-014 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

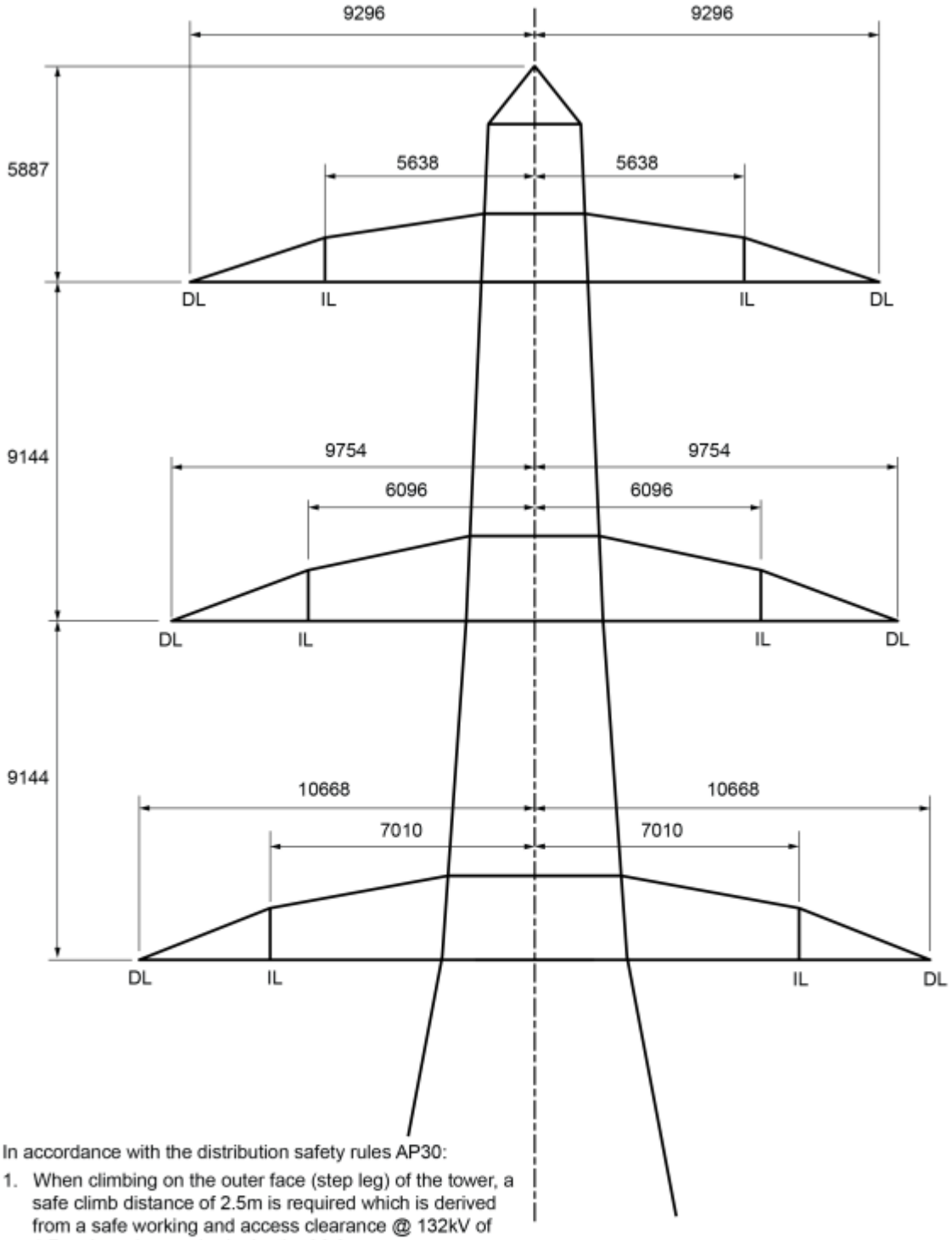


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/15

SAFE CLIMBING DIAGRAM FOR L2 D90 TYPE TOWER, INSULATED TO 400kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A1-015 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

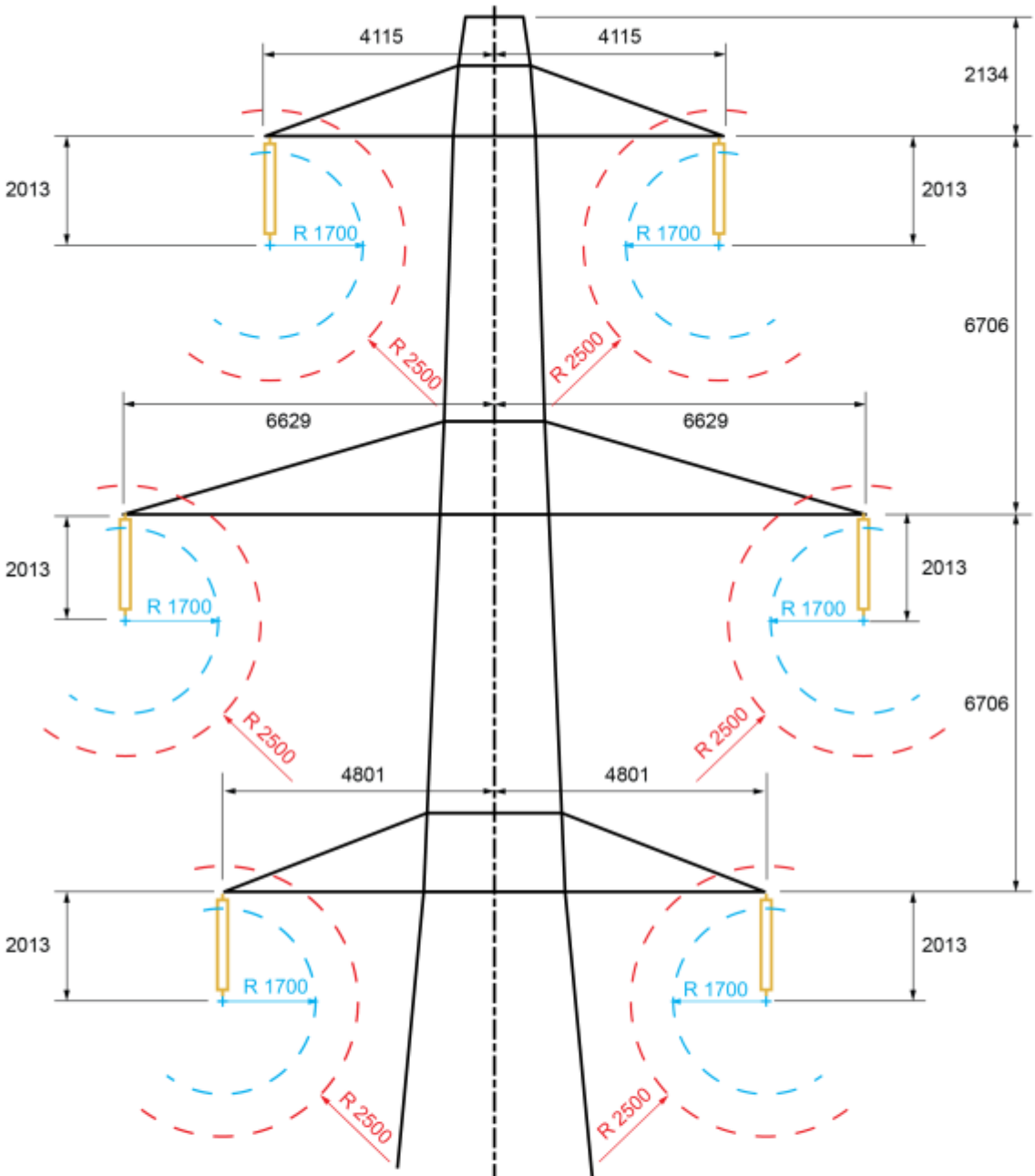


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. This diagram shows outline tower dimensions only. Site specific clearance diagrams to suit actual terminal arrangements are required.

NOTE:
This drawing is a copy of original CAD Drawing UU/L2SCD/16

SAFE CLIMBING DIAGRAM FOR L2 DT TYPE TOWER	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A1-016 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012



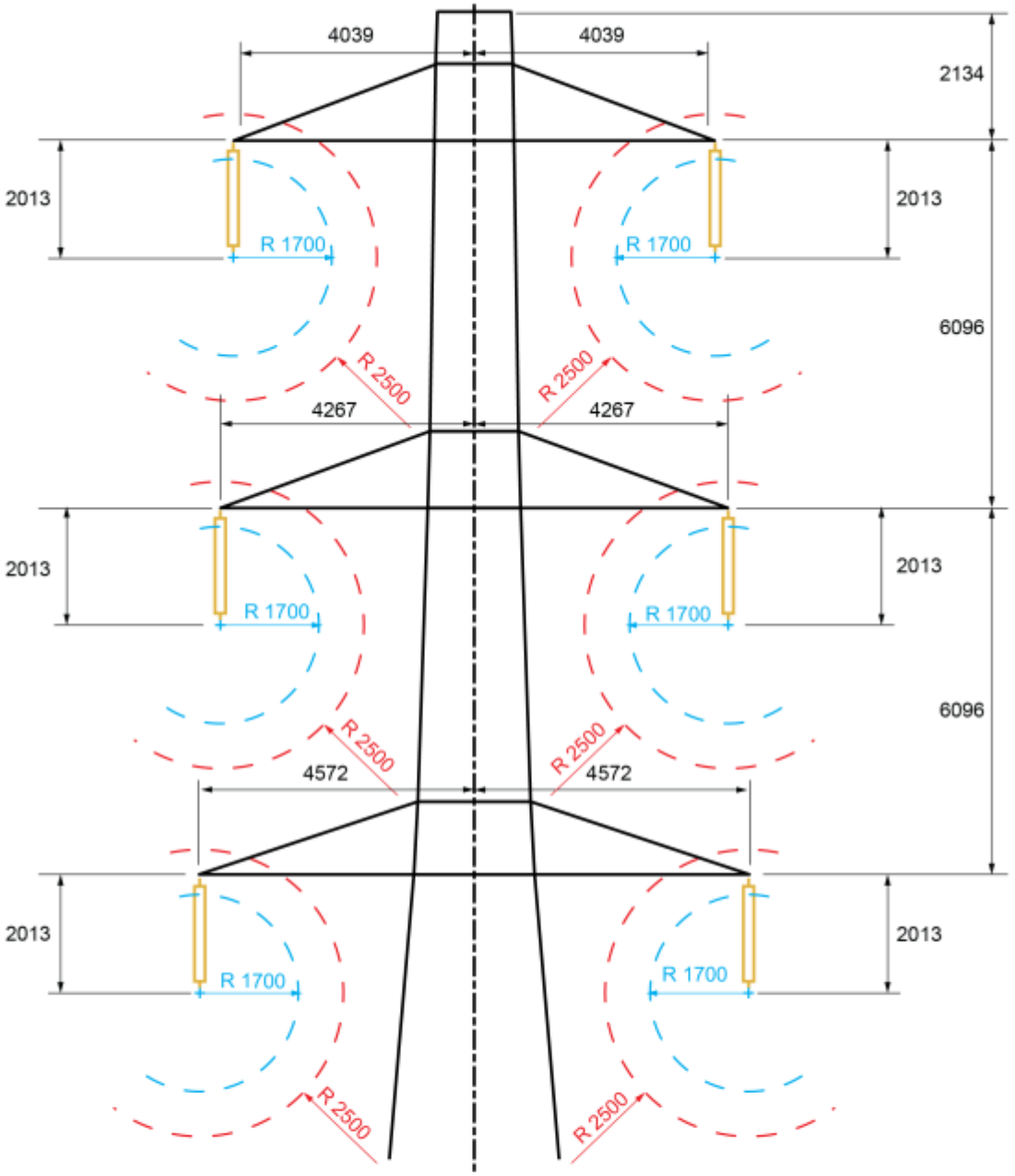
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:

This drawing is a copy of original CAD Drawing UU/L3SCD/01

SAFE CLIMBING DIAGRAM FOR L3 DS TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A2-001 Iss 2 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012



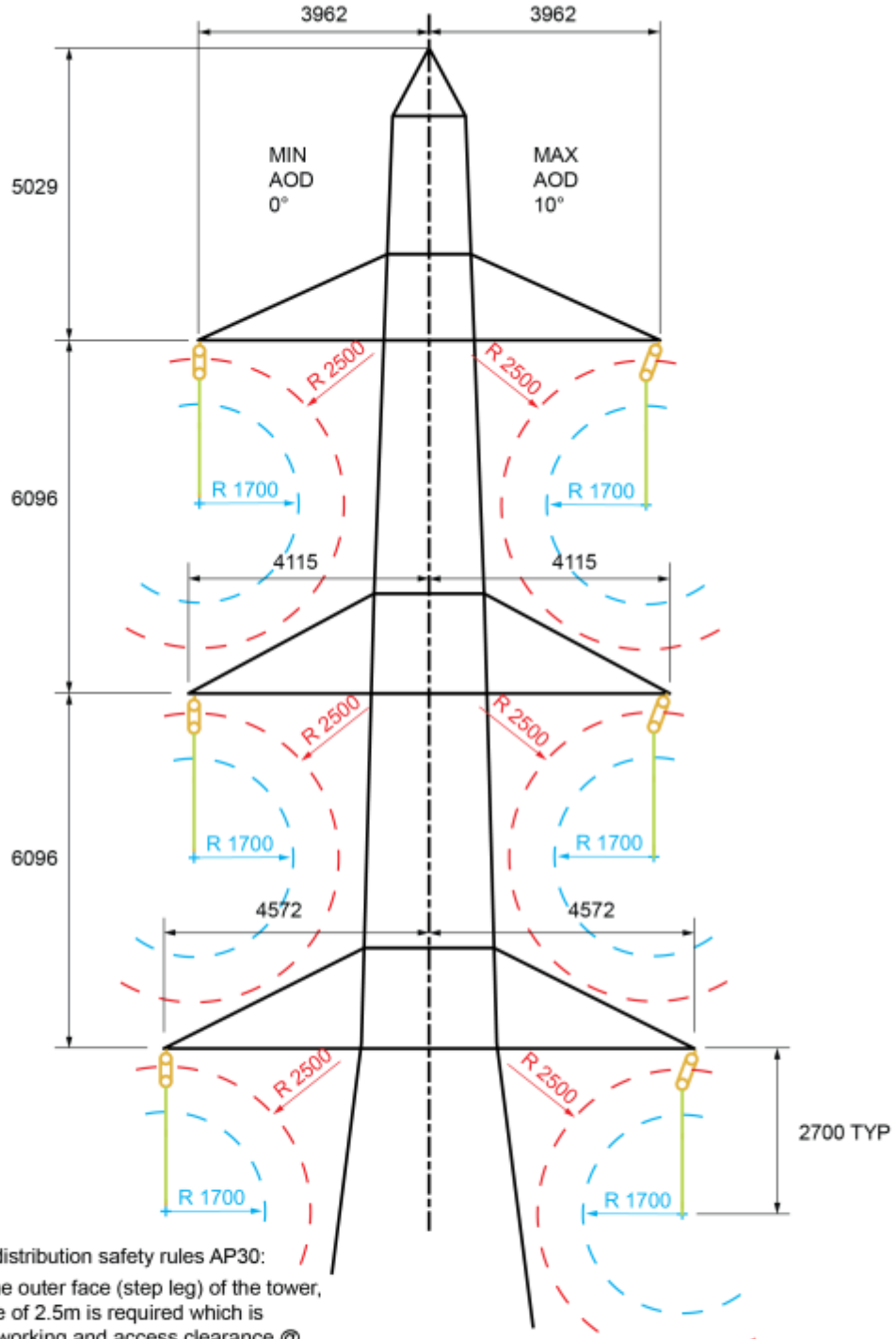
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:

This drawing is a copy of original CAD Drawing UU/L3SCD/02

SAFE CLIMBING DIAGRAM FOR L3 D TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A2-002 Iss 2 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

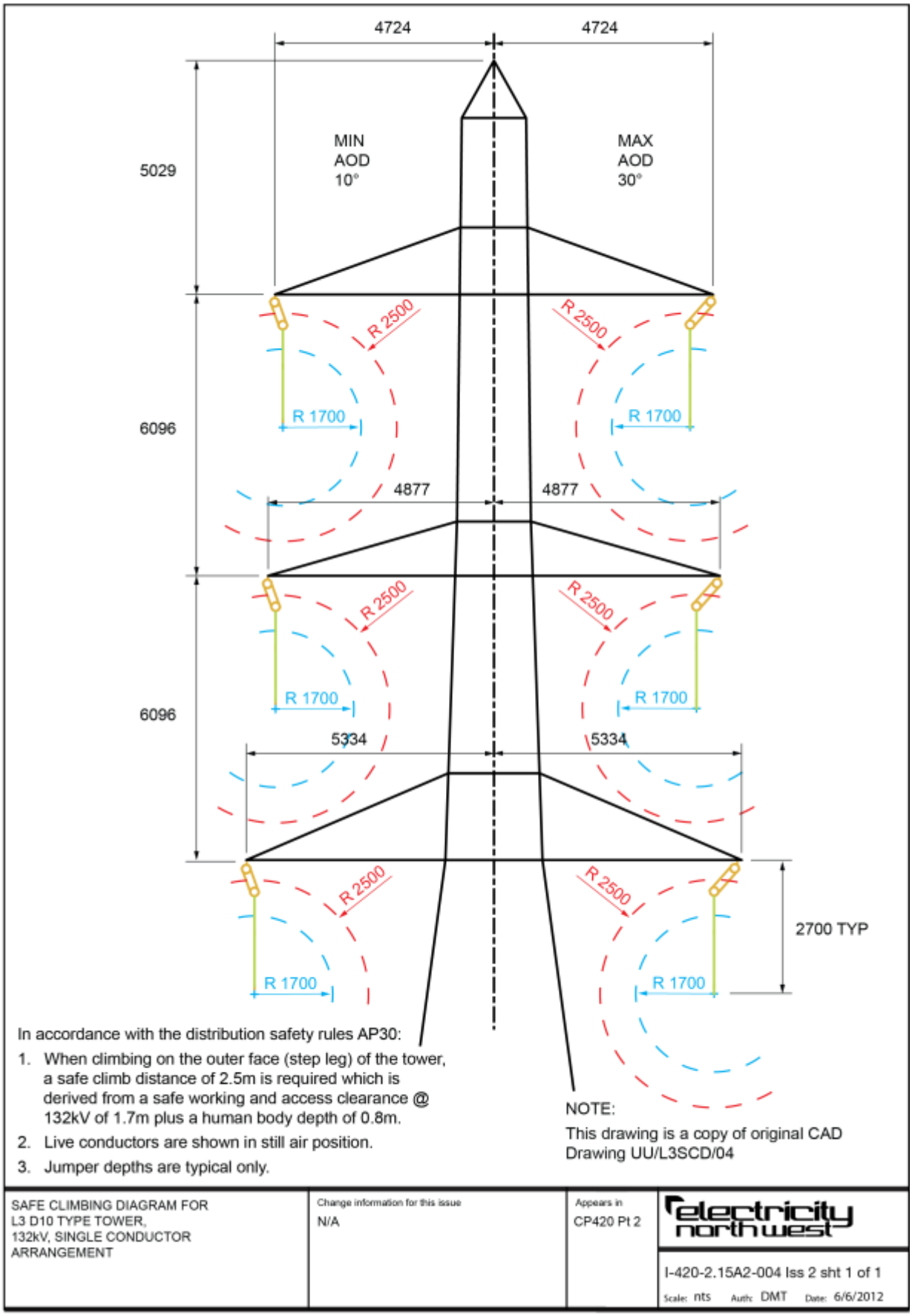


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L3SCD/03

SAFE CLIMBING DIAGRAM FOR L3 D10 TYPE TOWER, 132kV, SINGLE CONDUCTOR ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A2-003 Iss 2 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012



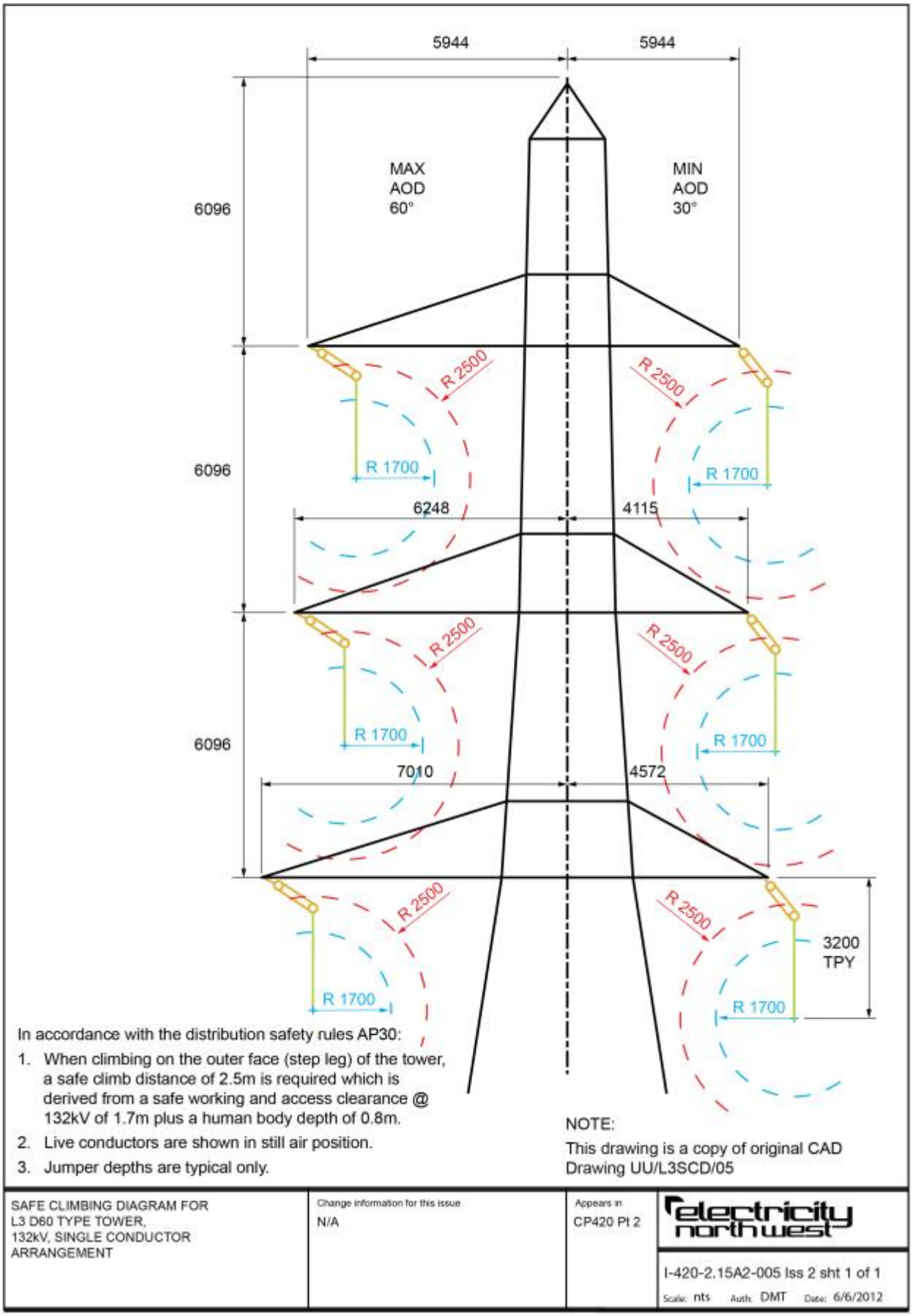
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:

This drawing is a copy of original CAD Drawing UU/L3SCD/04

SAFE CLIMBING DIAGRAM FOR L3 D10 TYPE TOWER, 132kV, SINGLE CONDUCTOR ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A2-004 Iss 2 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012



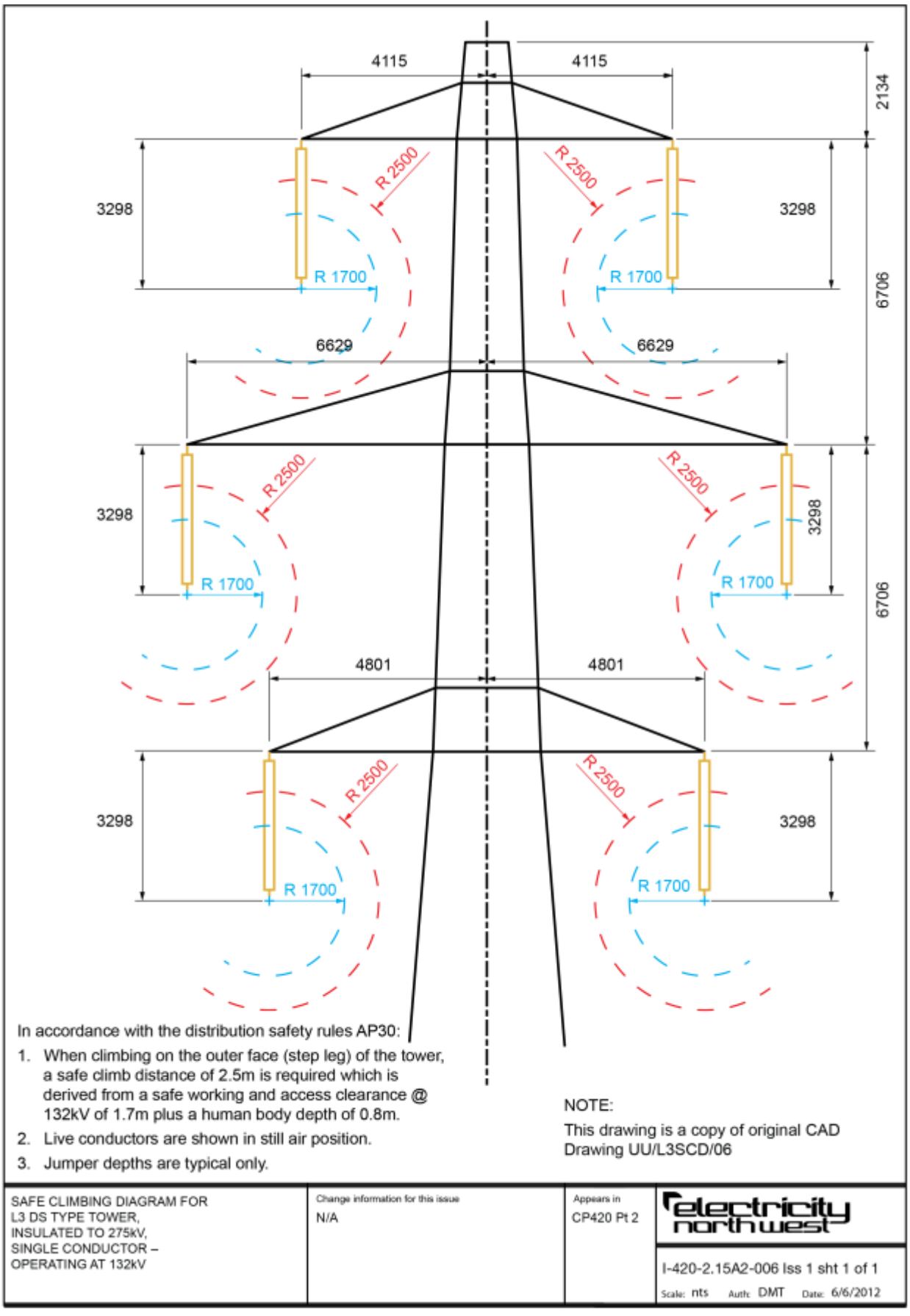
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:

This drawing is a copy of original CAD Drawing UU/L3SCD/05

SAFE CLIMBING DIAGRAM FOR L3 D60 TYPE TOWER, 132kV, SINGLE CONDUCTOR ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A2-005 Iss 2 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012



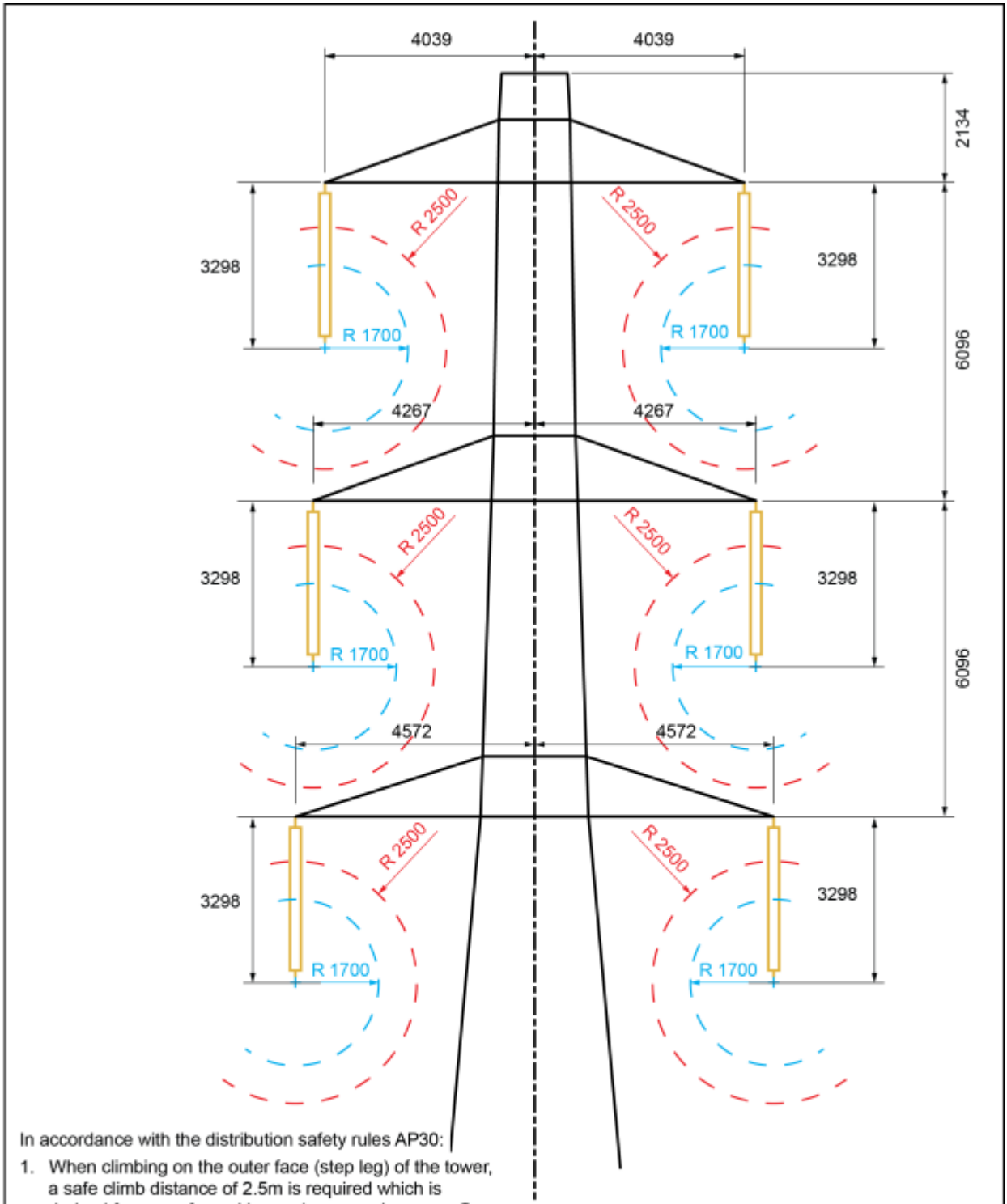
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:

This drawing is a copy of original CAD Drawing UU/L3SCD/06

SAFE CLIMBING DIAGRAM FOR L3 DS TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR – OPERATING AT 132kV	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A2-006 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

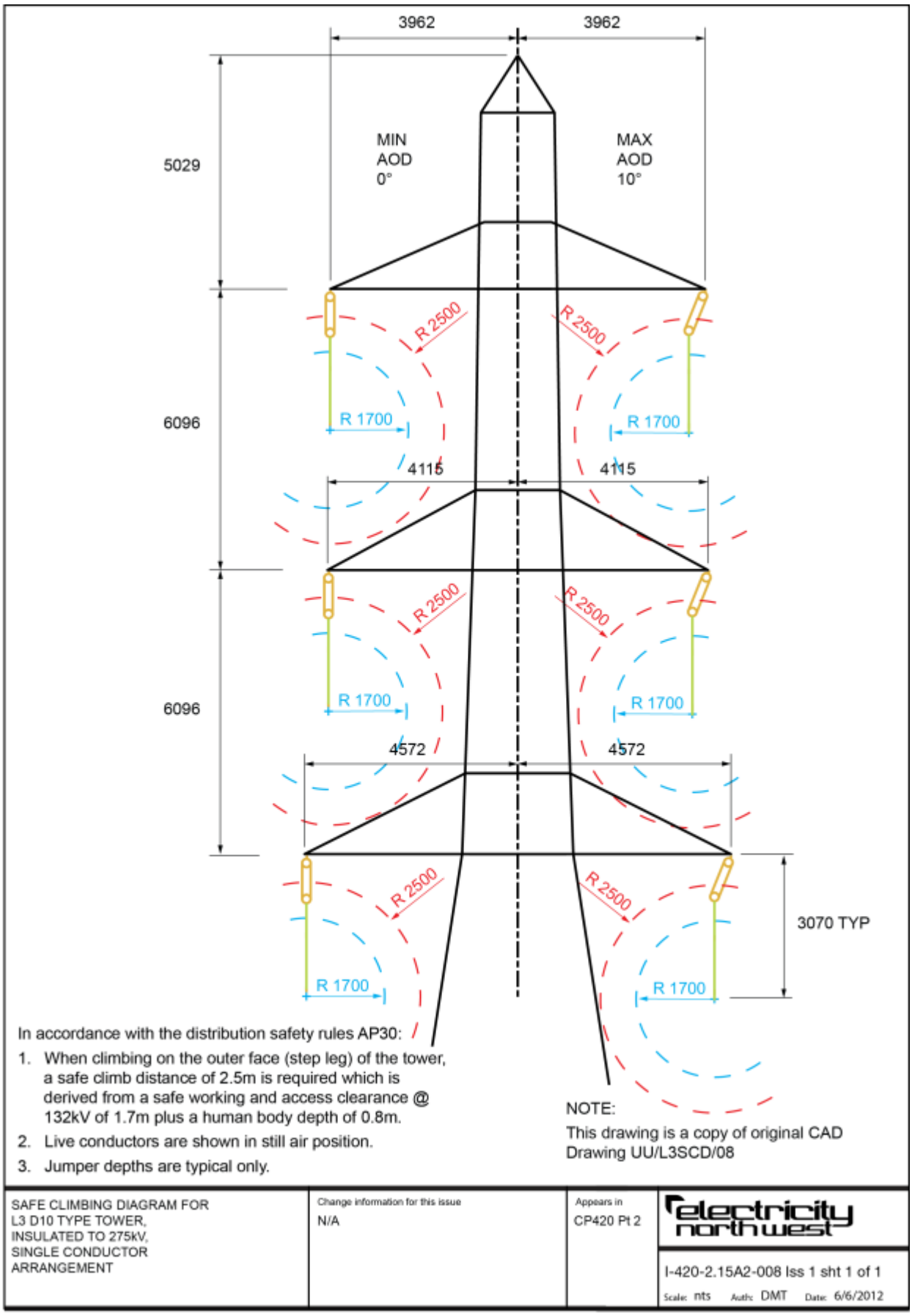


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L3SCD/07

SAFE CLIMBING DIAGRAM FOR L3 D TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR ARRANGEMENT	Change information for this issue N/A	Appears in CP420 Pt 2	electricity north west I-420-2.15A2-007 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

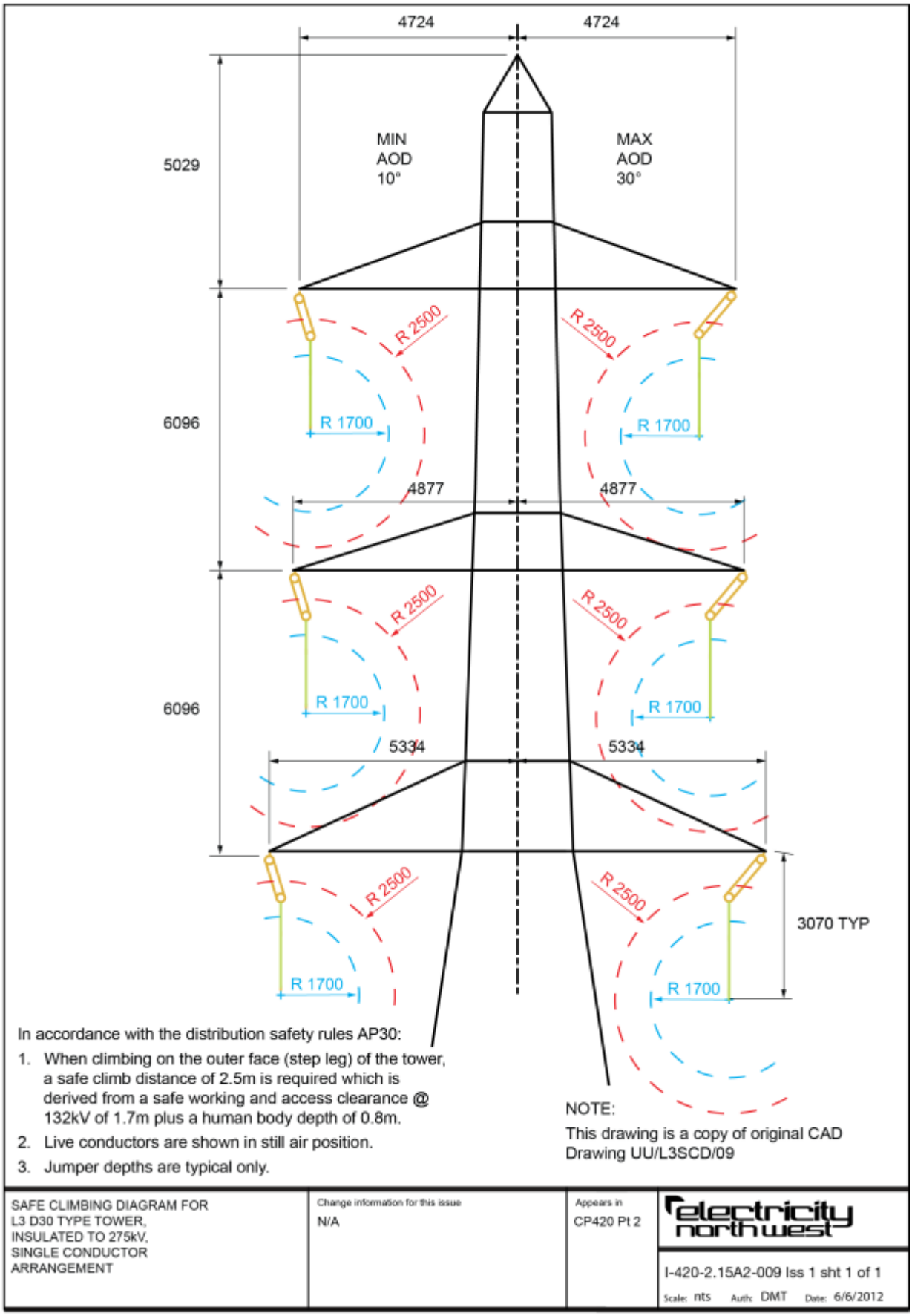


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L3SCD/08

SAFE CLIMBING DIAGRAM FOR L3 D10 TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR ARRANGEMENT	Change information for this issue N/A	Appears in CP420 Pt 2	electricity north west I-420-2.15A2-008 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

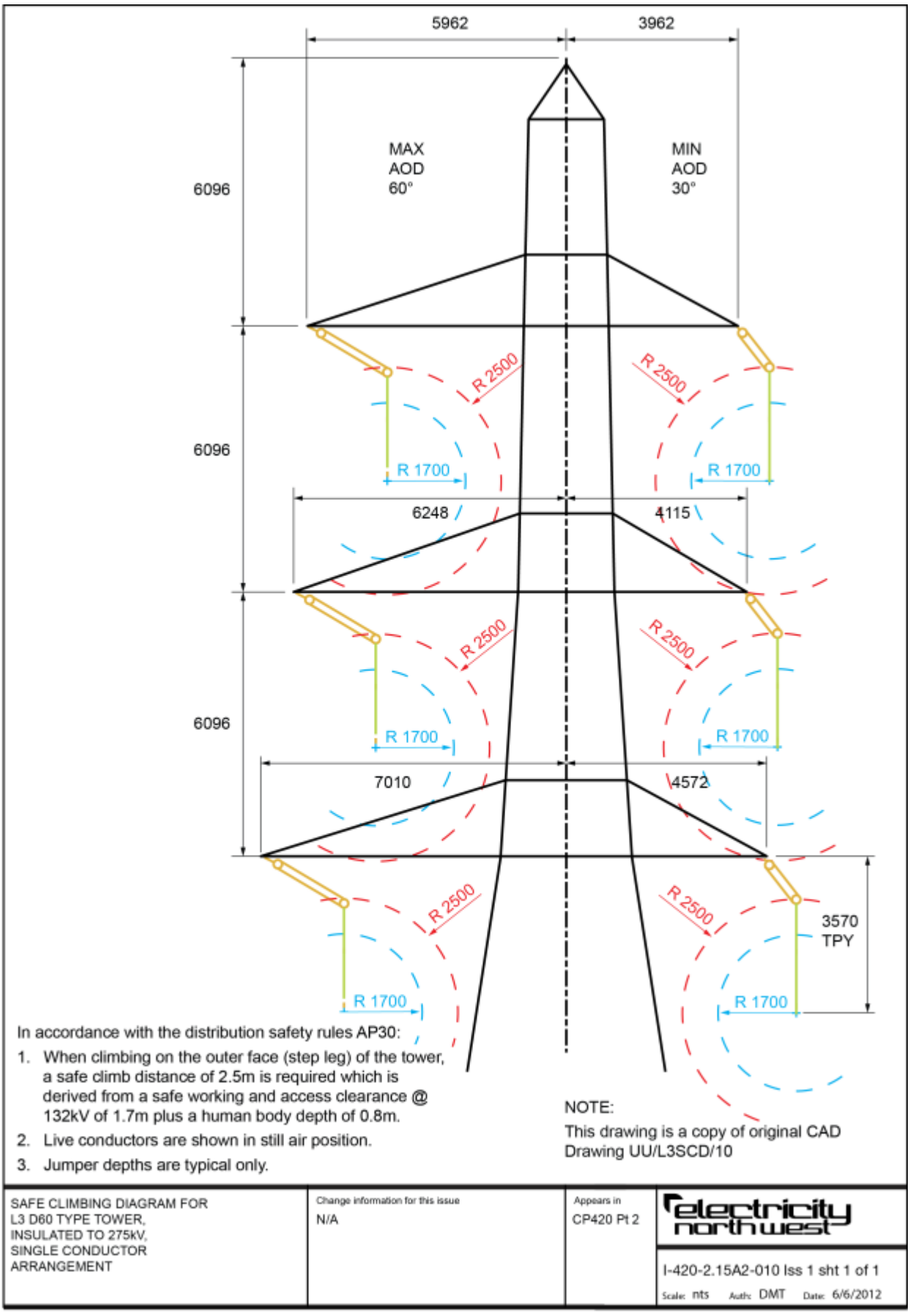


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L3SCD/09

SAFE CLIMBING DIAGRAM FOR L3 D30 TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A2-009 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

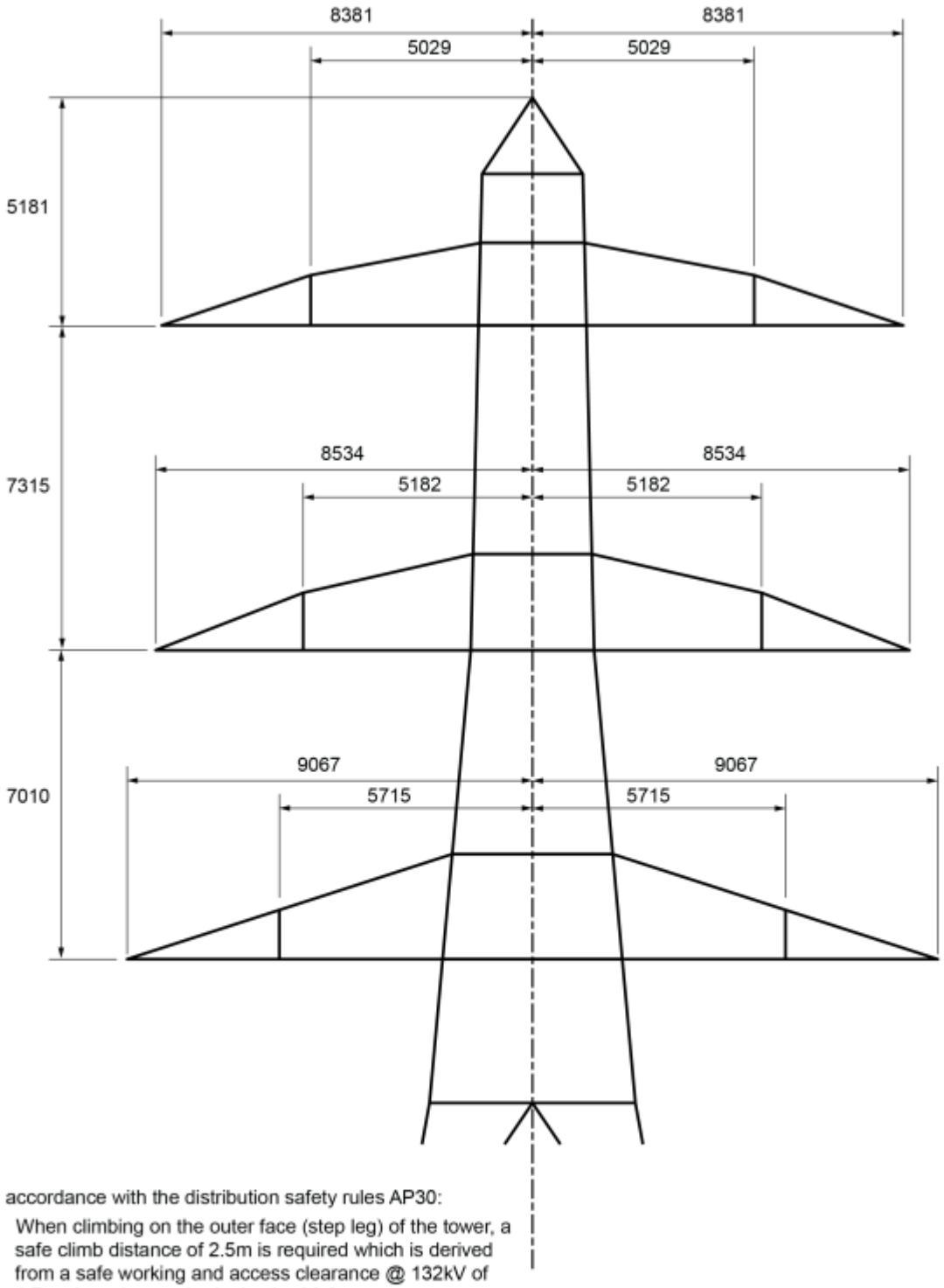


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L3SCD/10

SAFE CLIMBING DIAGRAM FOR L3 D60 TYPE TOWER, INSULATED TO 275kV, SINGLE CONDUCTOR ARRANGEMENT	Change information for this issue N/A	Appears in CP420 Pt 2	electricity north west I-420-2.15A2-010 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

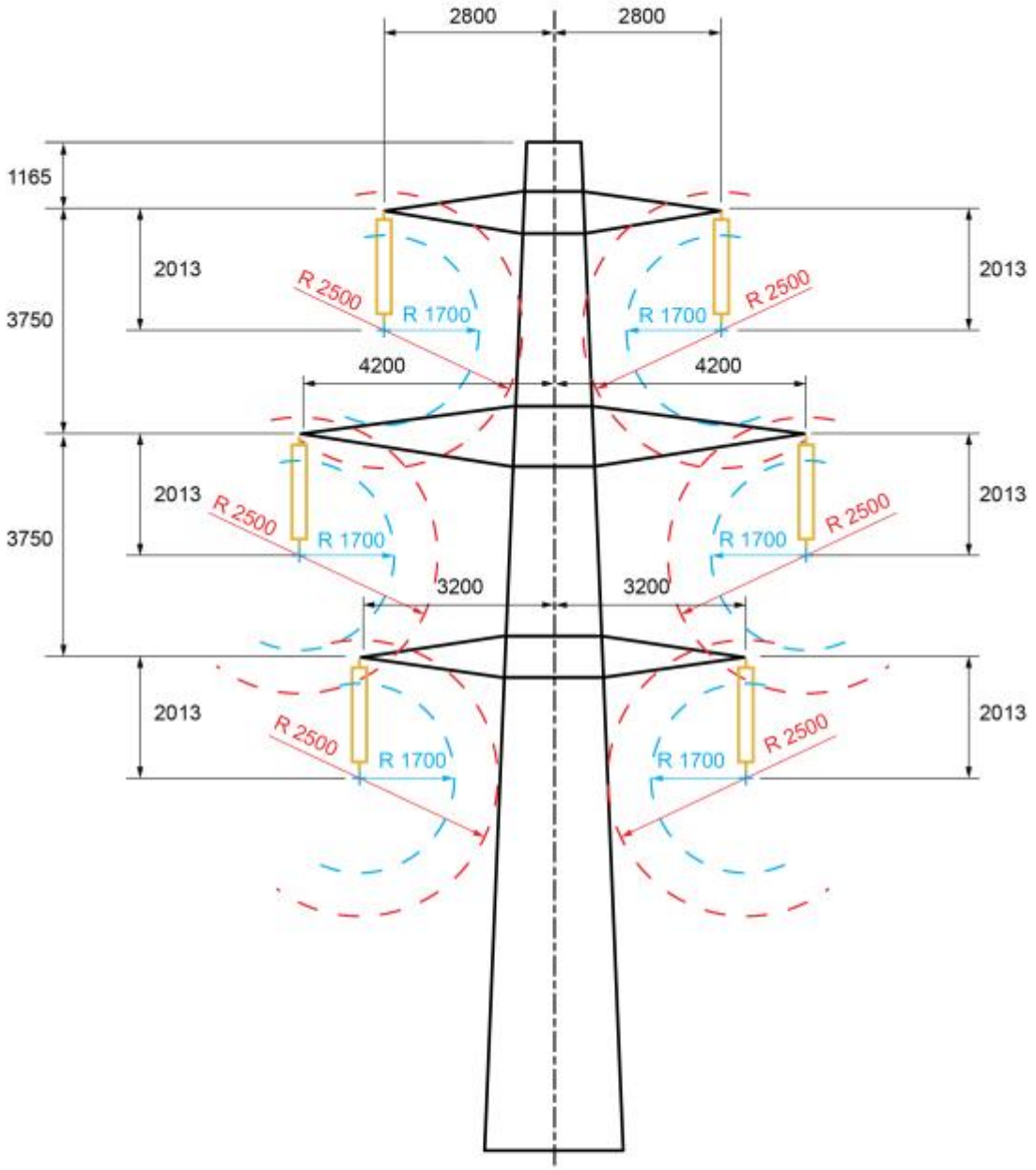


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. This diagram shows outline tower dimensions only. Site specific clearance diagrams to suit actual terminal arrangements are required.

NOTE:
This drawing is a copy of original CAD Drawing UU/L3SCD/11

SAFE CLIMBING DIAGRAM FOR L3 DT TYPE TOWER	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A2-011 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

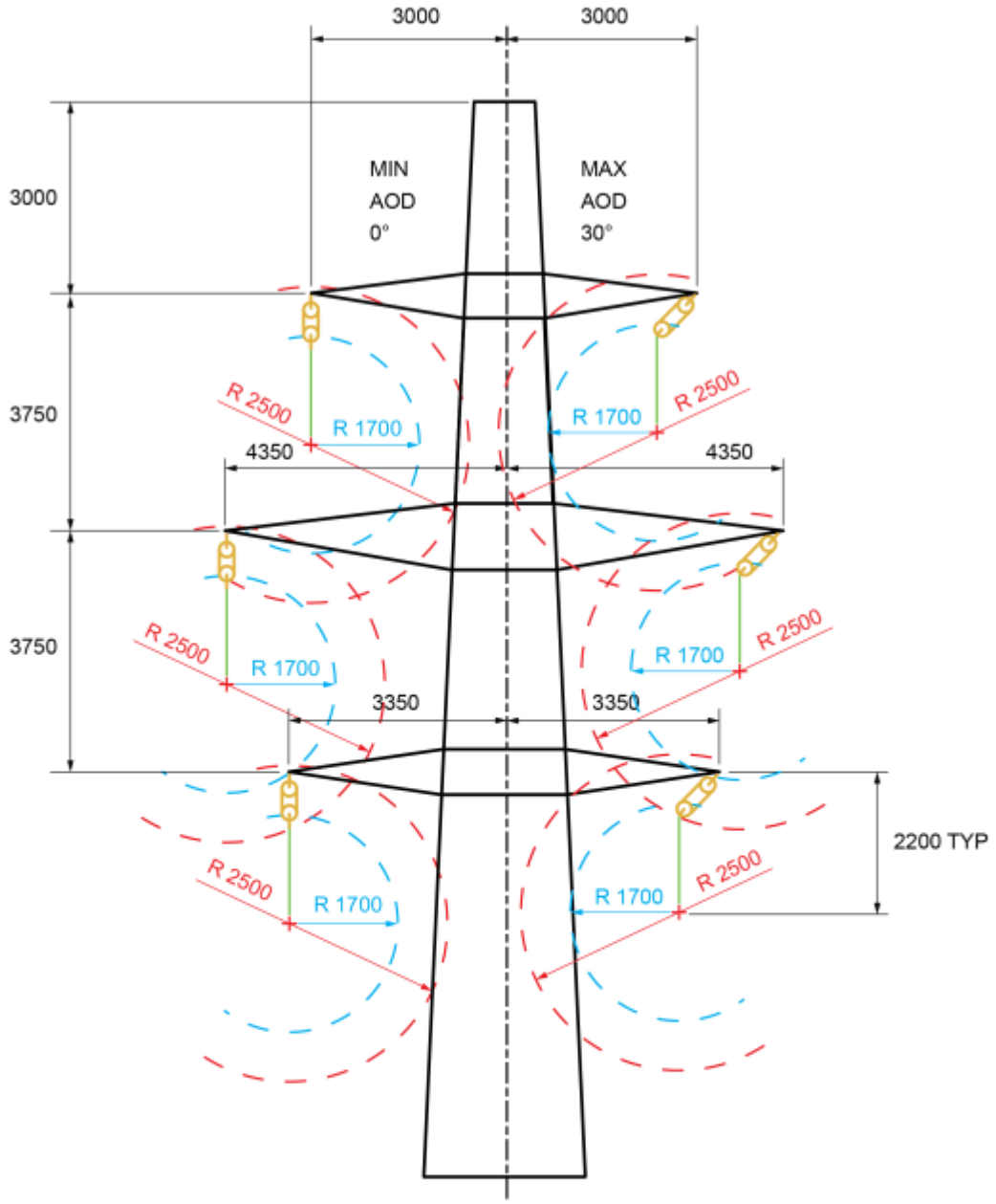


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L4SCD/01

SAFE CLIMBING DIAGRAM FOR L4m D TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A3-001 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

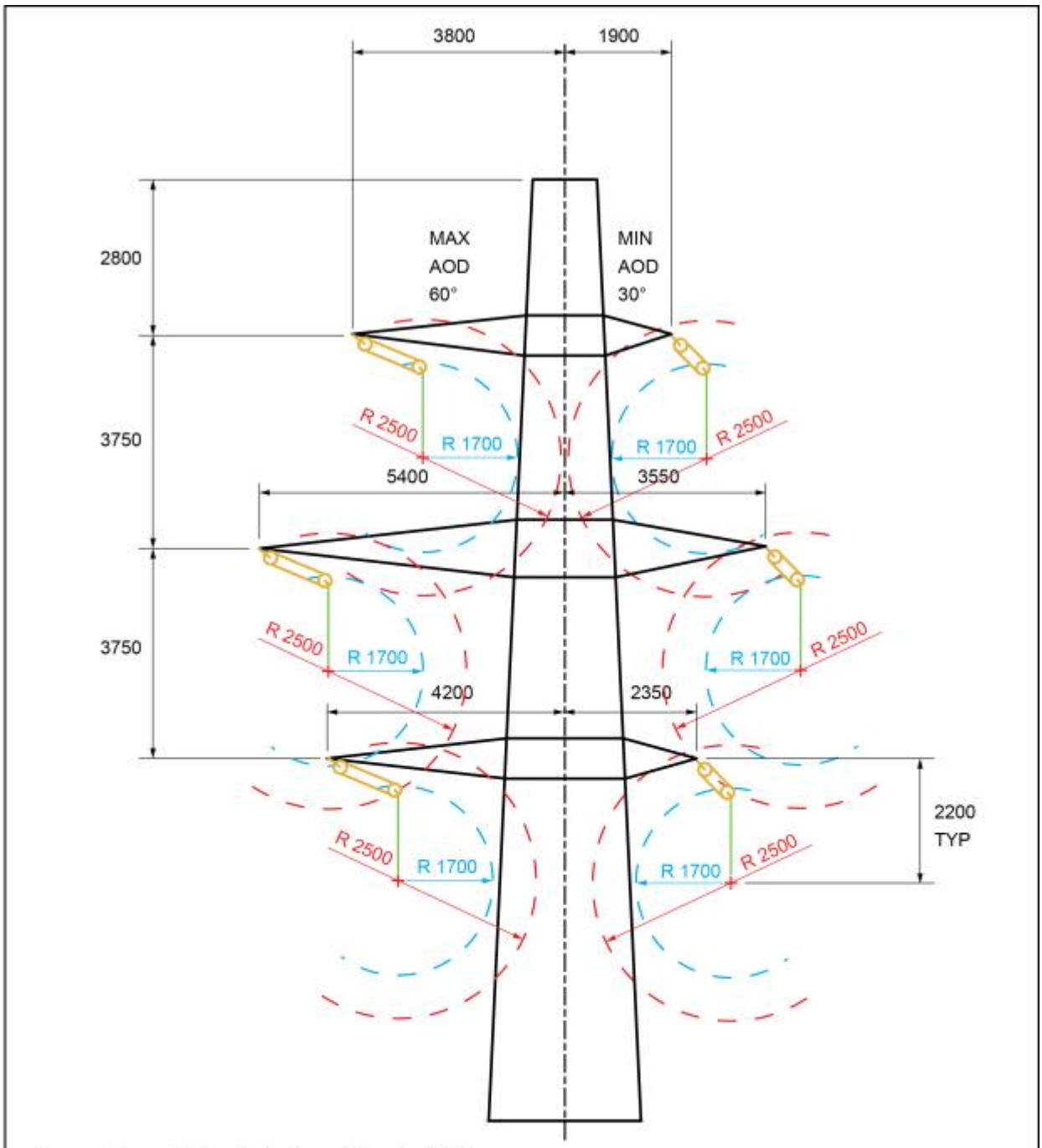


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L4SCD/02

SAFE CLIMBING DIAGRAM FOR L4m D30 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	I-420-2.15A3-002 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

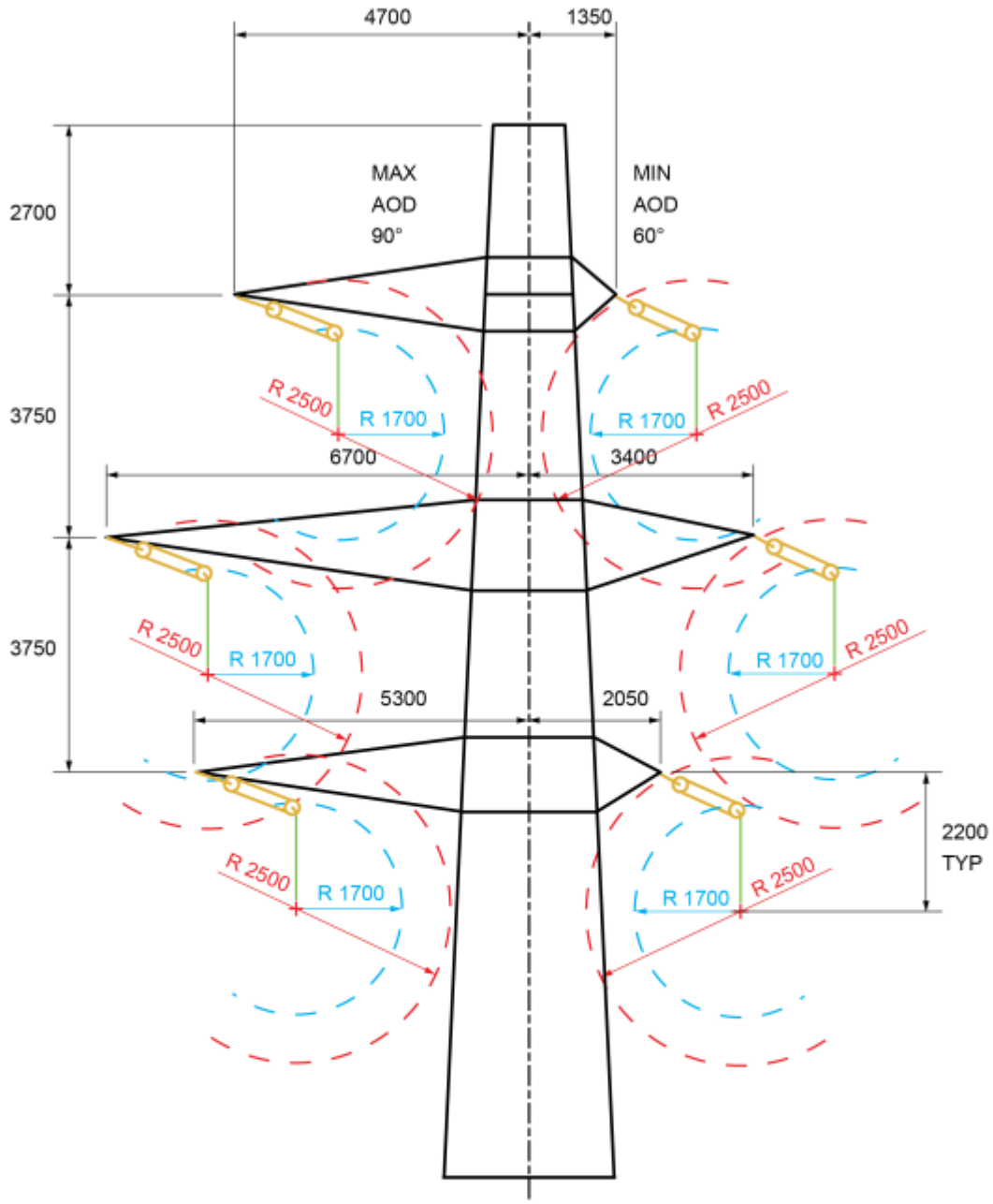


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L4SCD/03

SAFE CLIMBING DIAGRAM FOR L4m D60 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A3-003 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

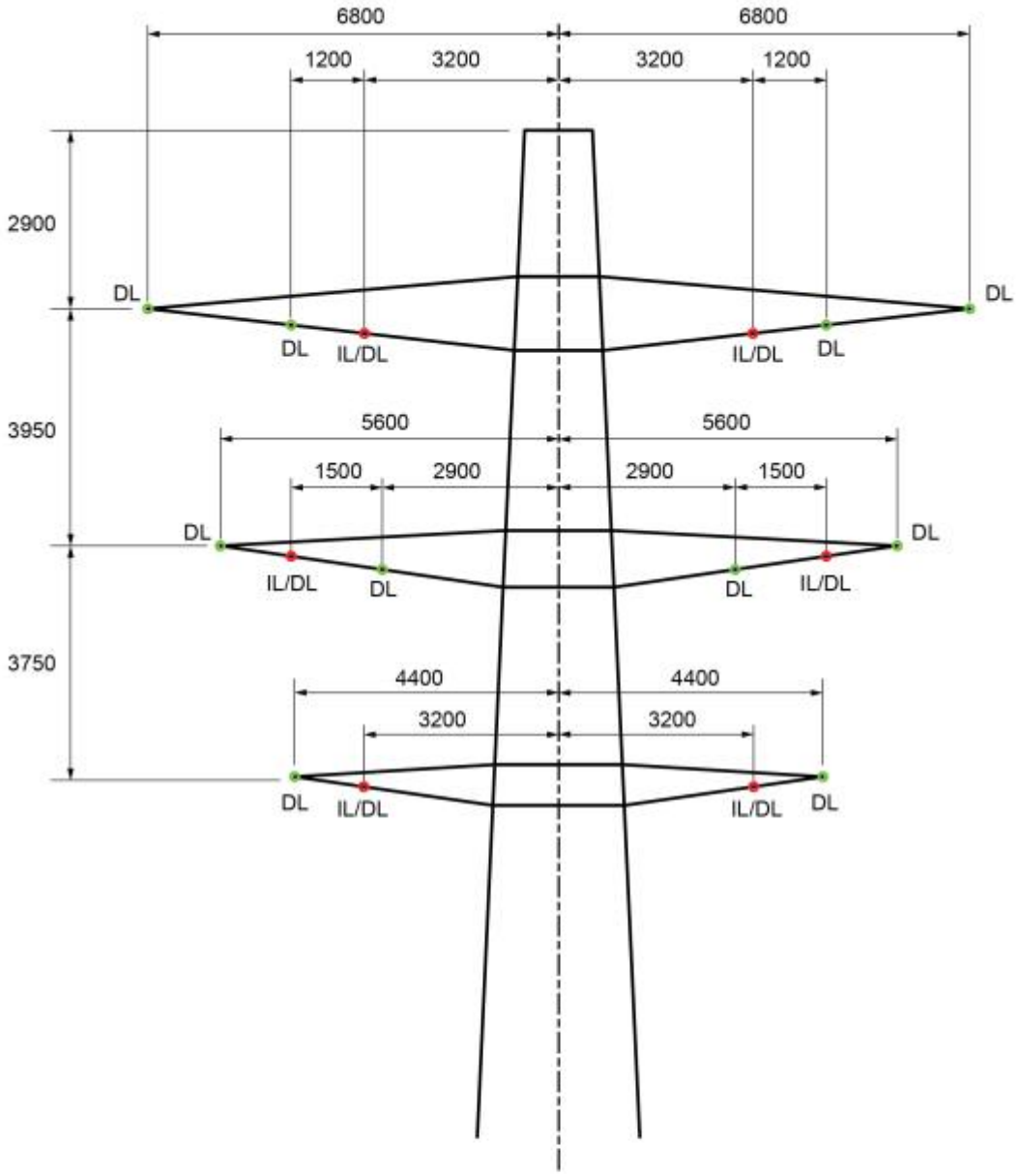


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L4SCD/04

SAFE CLIMBING DIAGRAM FOR L4m D90 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A3-004 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012



In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. This diagram shows outline tower dimensions only. Site specific clearance diagrams to suit actual terminal arrangements are required.

LEGEND

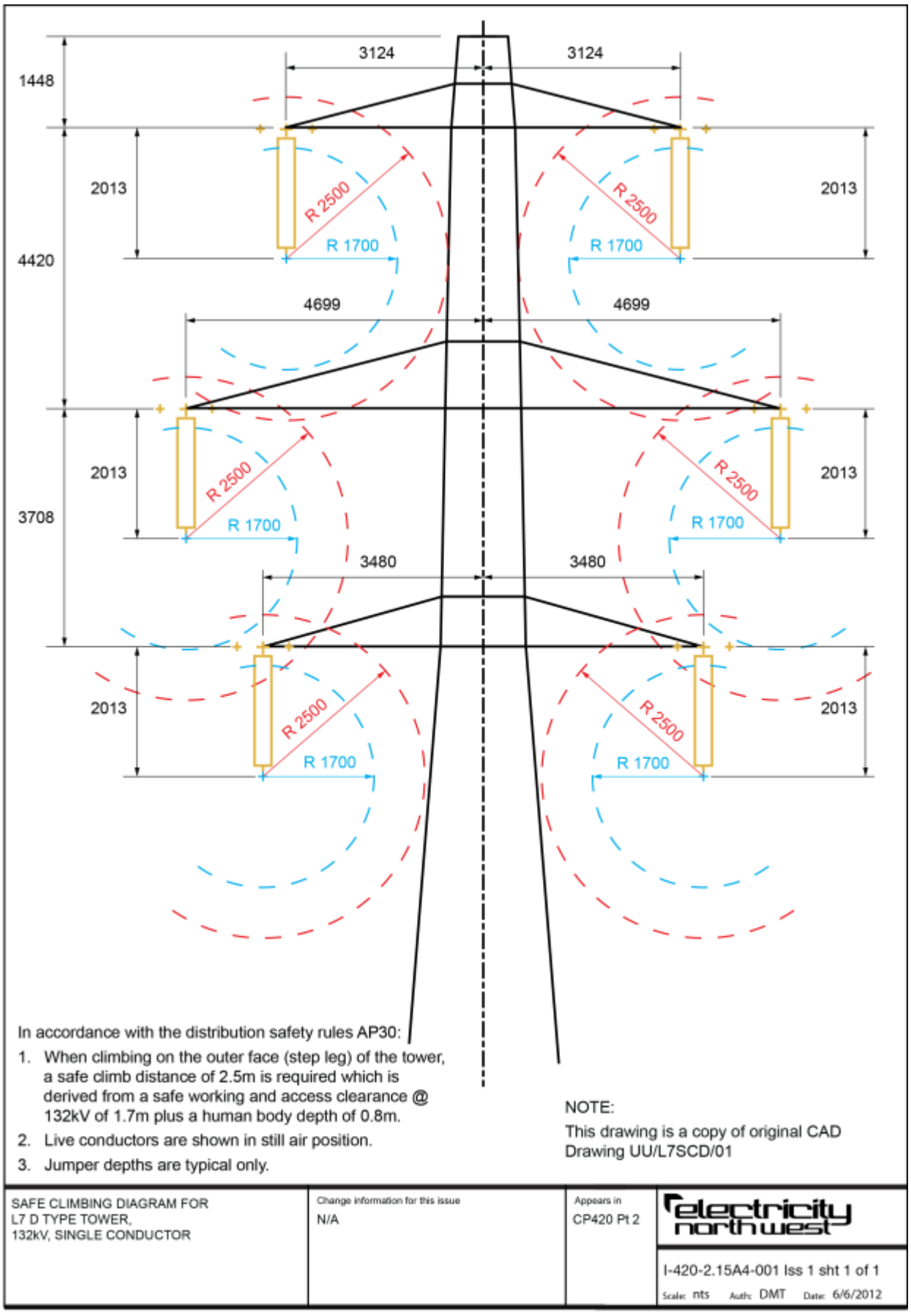
IL – Incoming line attachment

DL – Downlead attachment

NOTE:

This drawing is a copy of original CAD Drawing UU/L4SCD/05

SAFE CLIMBING DIAGRAM FOR L4m DT TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A3-005 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

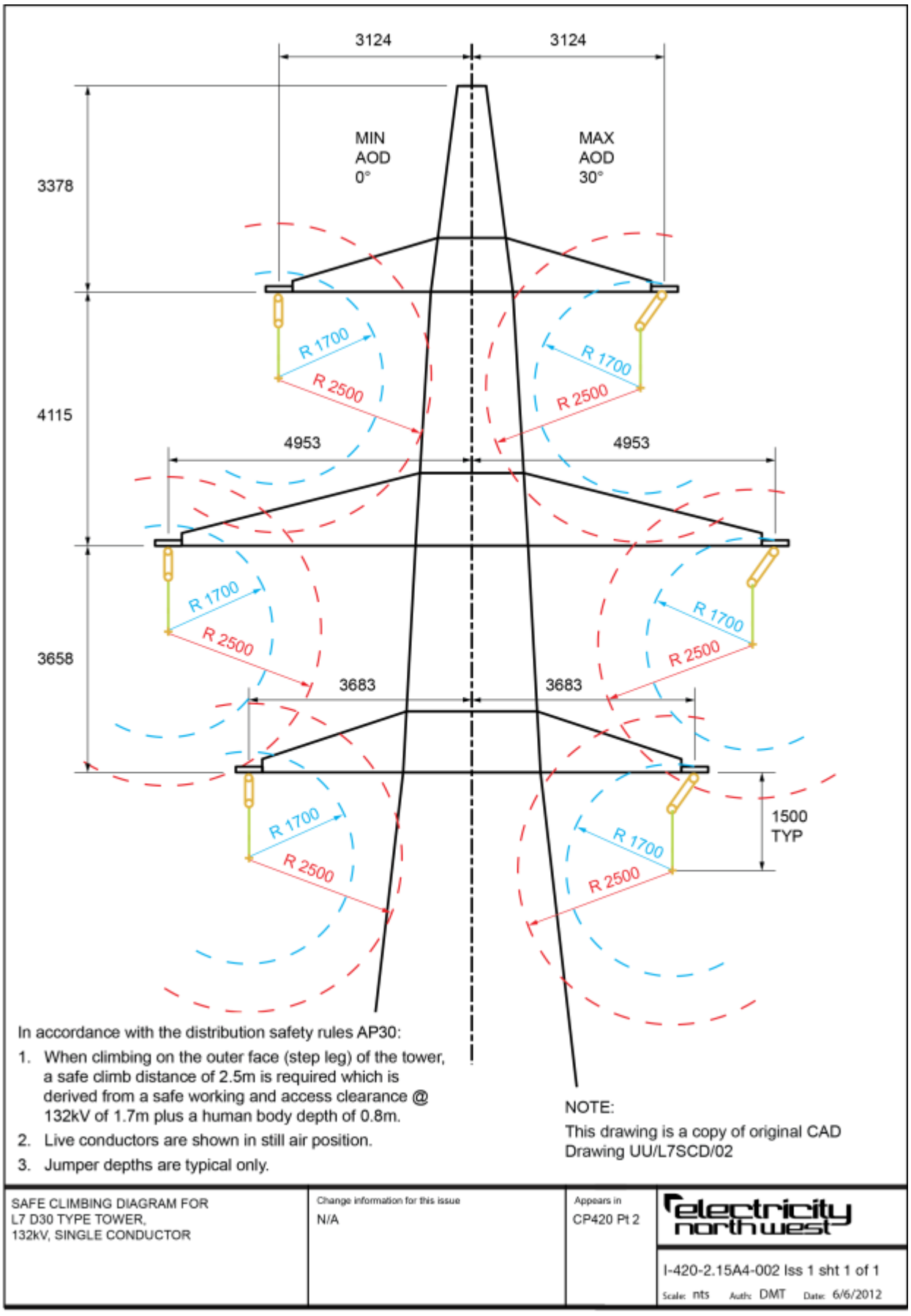


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L7SCD/01

SAFE CLIMBING DIAGRAM FOR L7 D TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A4-001 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

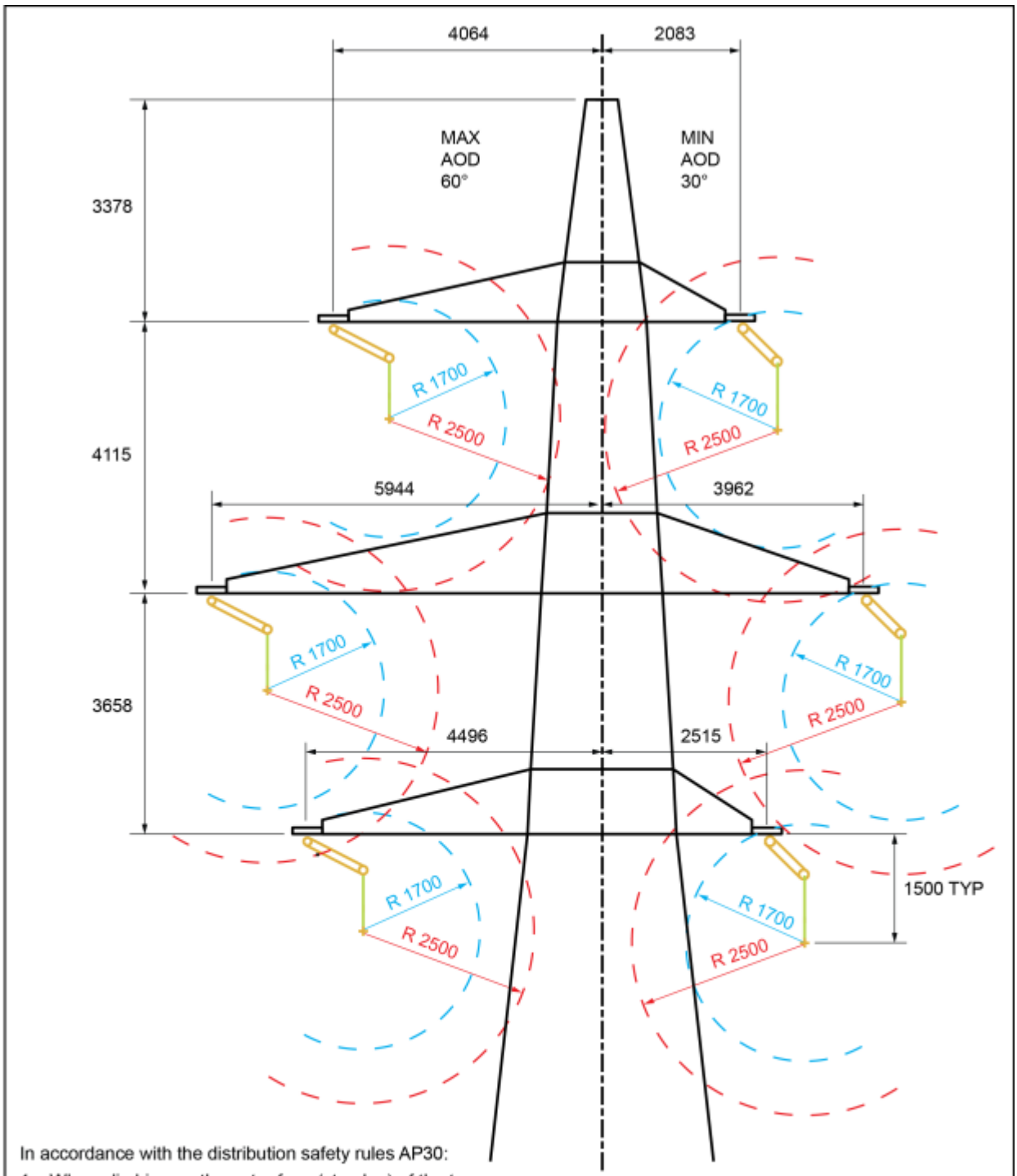


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L7SCD/02

SAFE CLIMBING DIAGRAM FOR L7 D30 TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A4-002 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

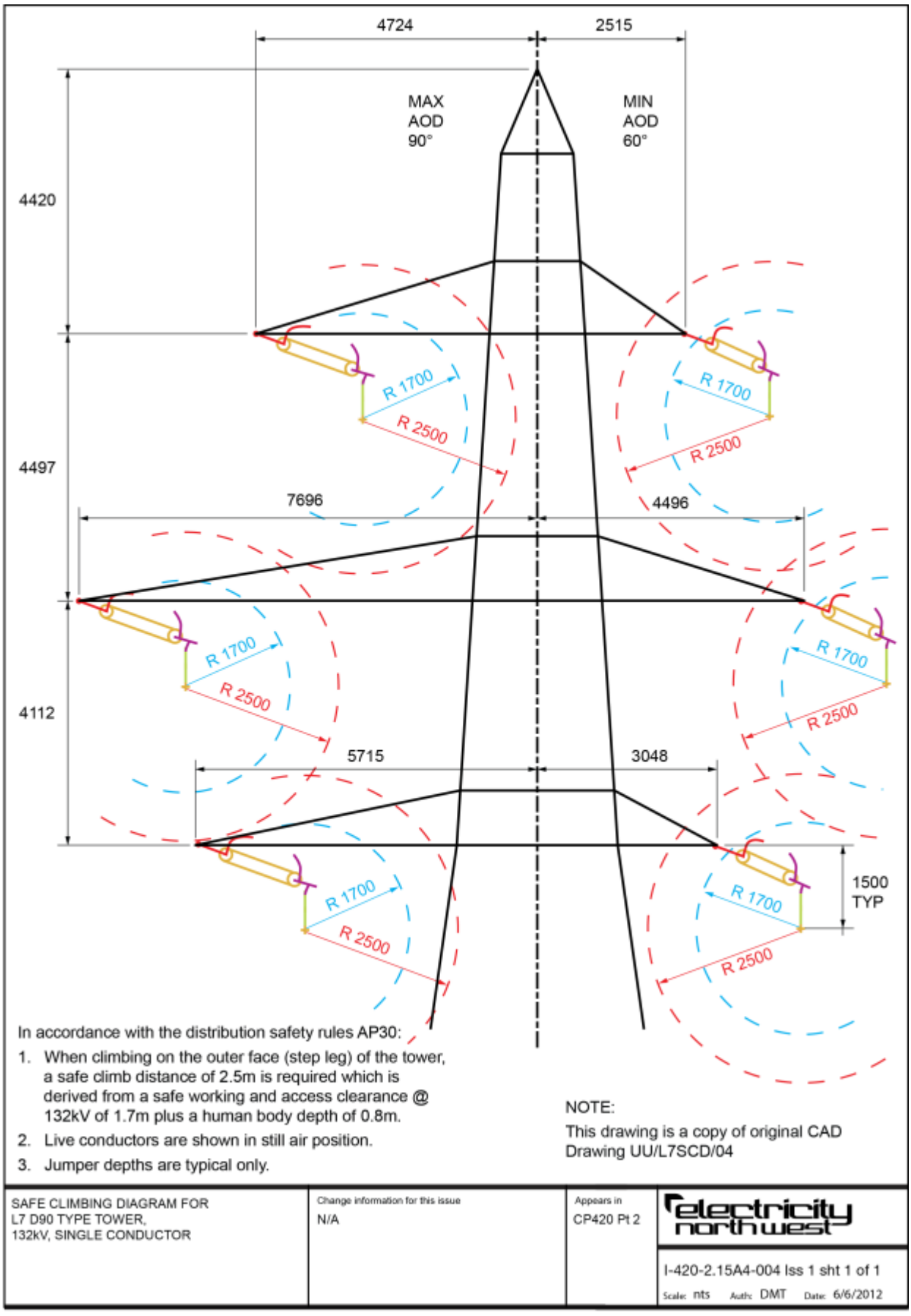


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L7SCD/03

SAFE CLIMBING DIAGRAM FOR L7 D60 TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A4-003 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

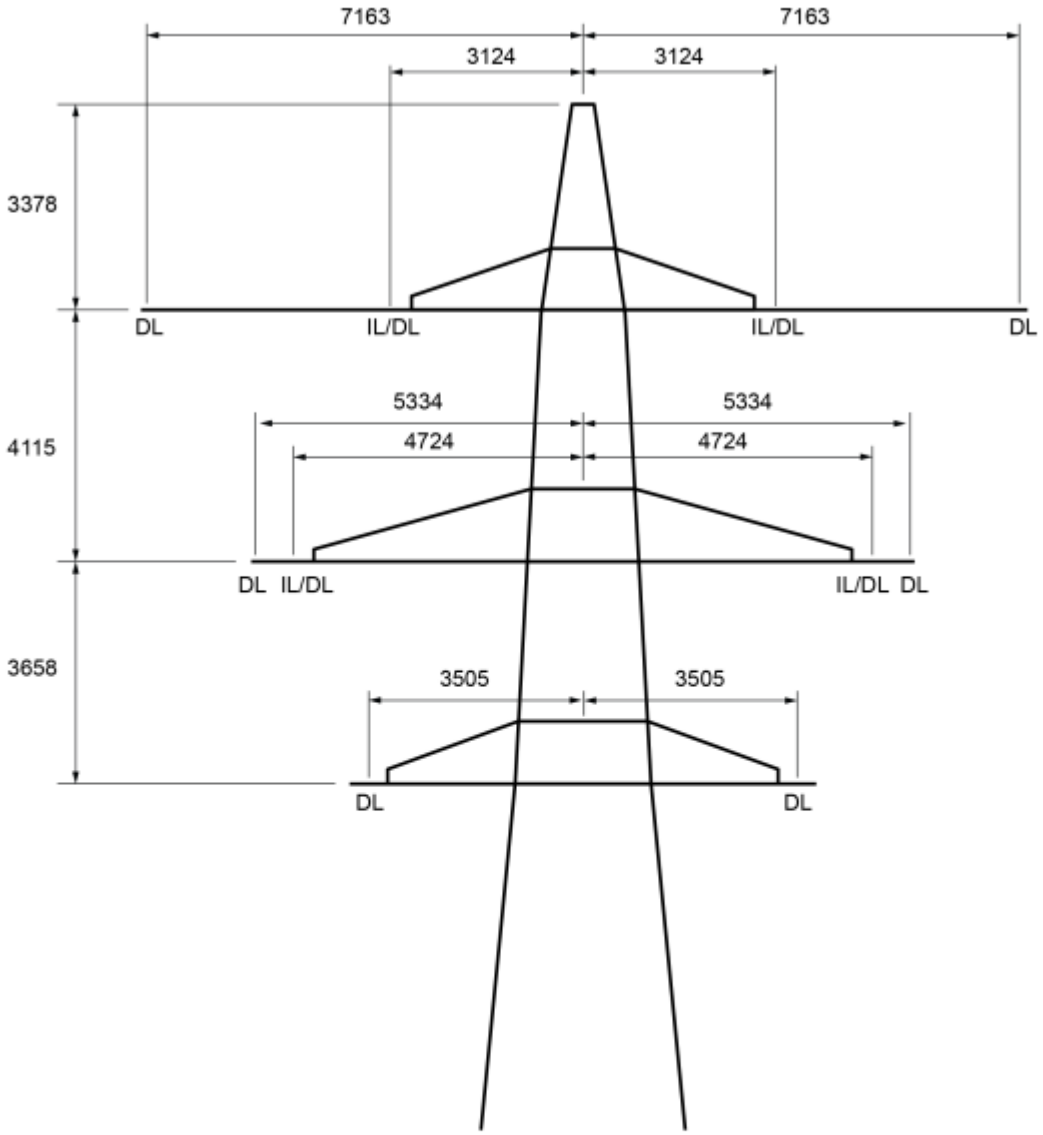


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/L7SCD/04

SAFE CLIMBING DIAGRAM FOR L7 D90 TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A4-004 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012



In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. This diagram shows outline tower dimensions only. Site specific clearance diagrams to suit actual terminal arrangements are required.

LEGEND

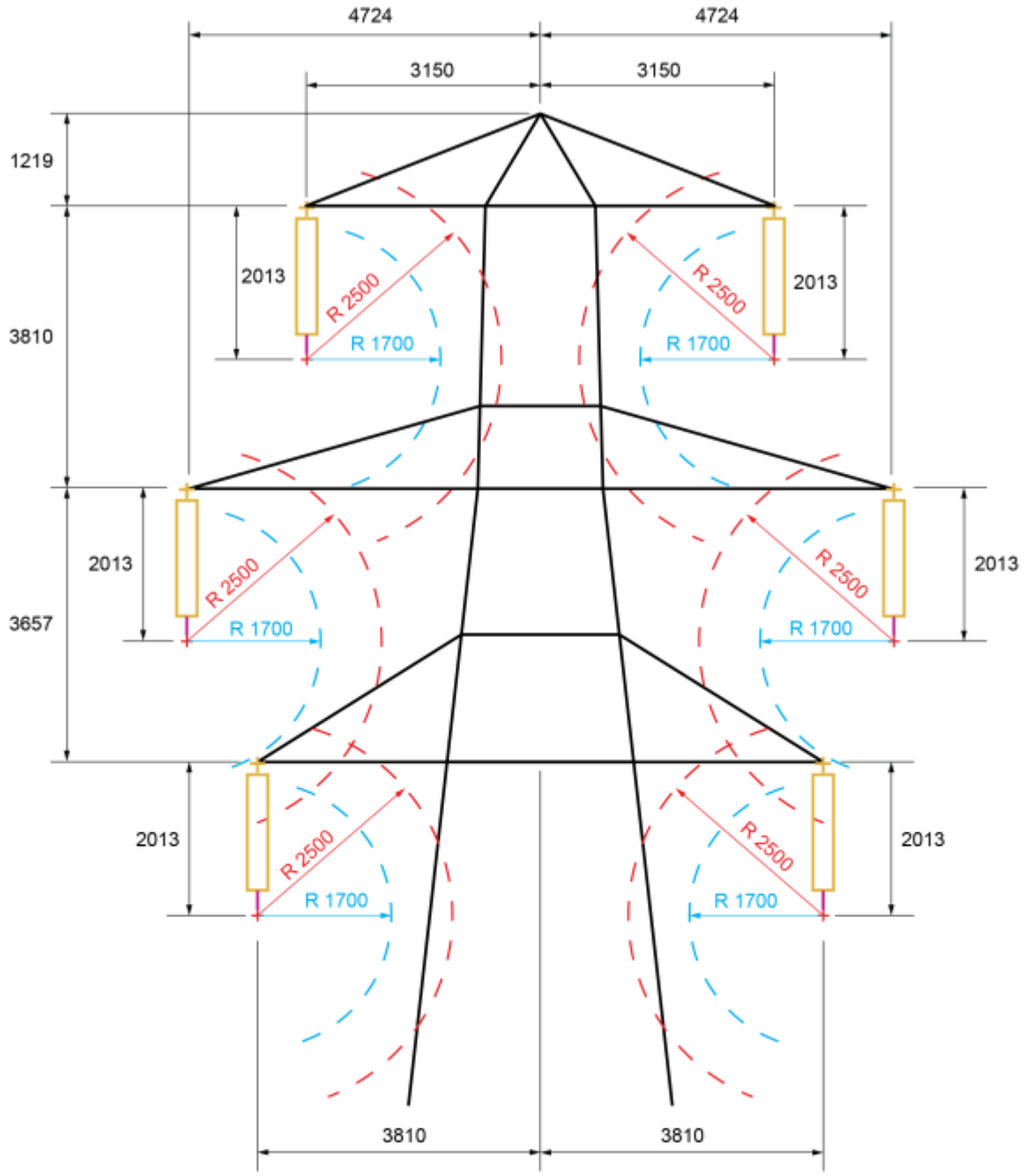
IL – Incoming line attachment

DL – Downlead attachment

NOTE:

This drawing is a copy of original CAD Drawing UU/L7SCD/05

SAFE CLIMBING DIAGRAM FOR L7 DT TYPE TOWER, 132kV, SINGLE CONDUCTOR	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A4-005 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

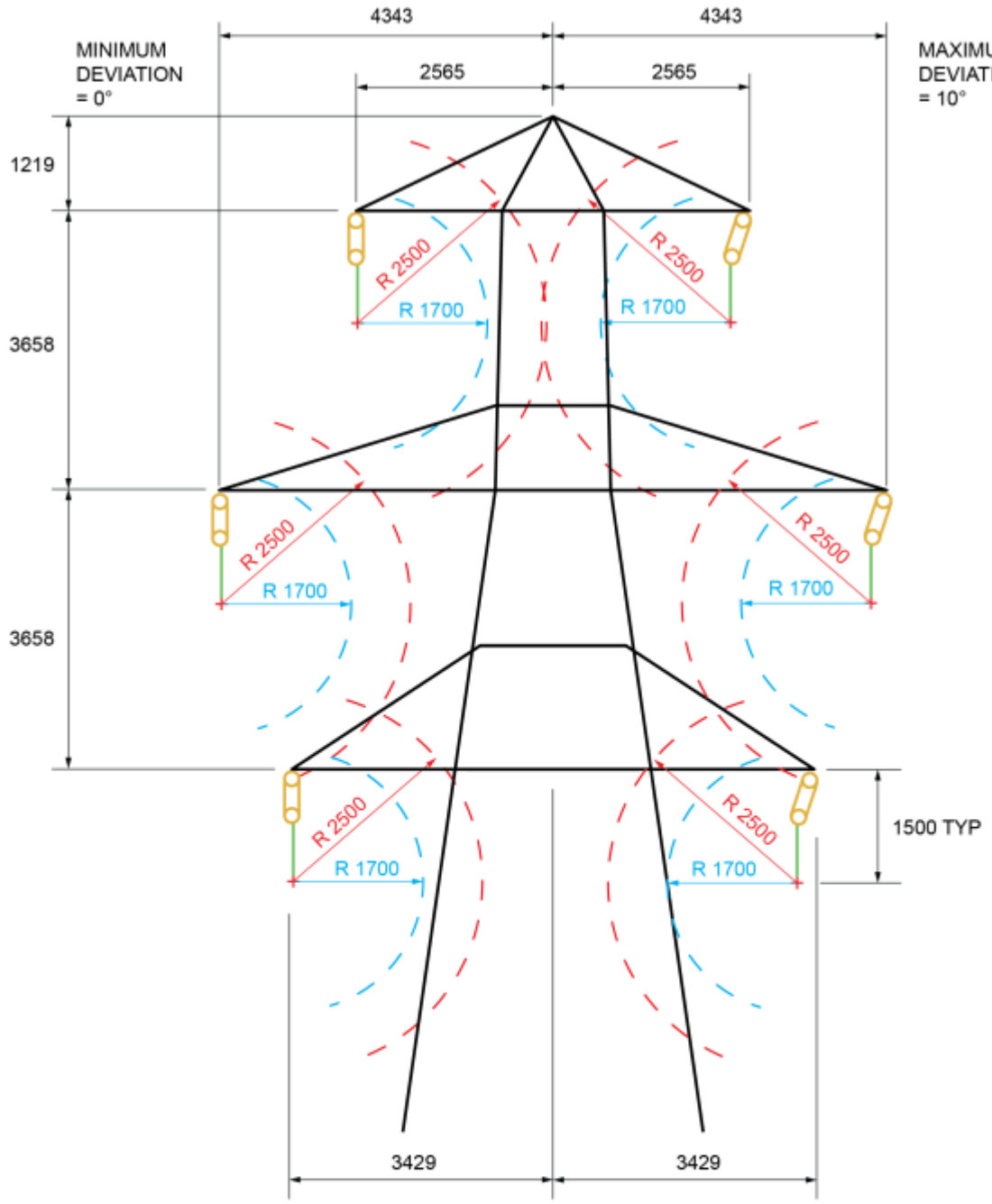


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL1SCD/01

SAFE CLIMBING DIAGRAM FOR NWE PL1 D2 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A5-001 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

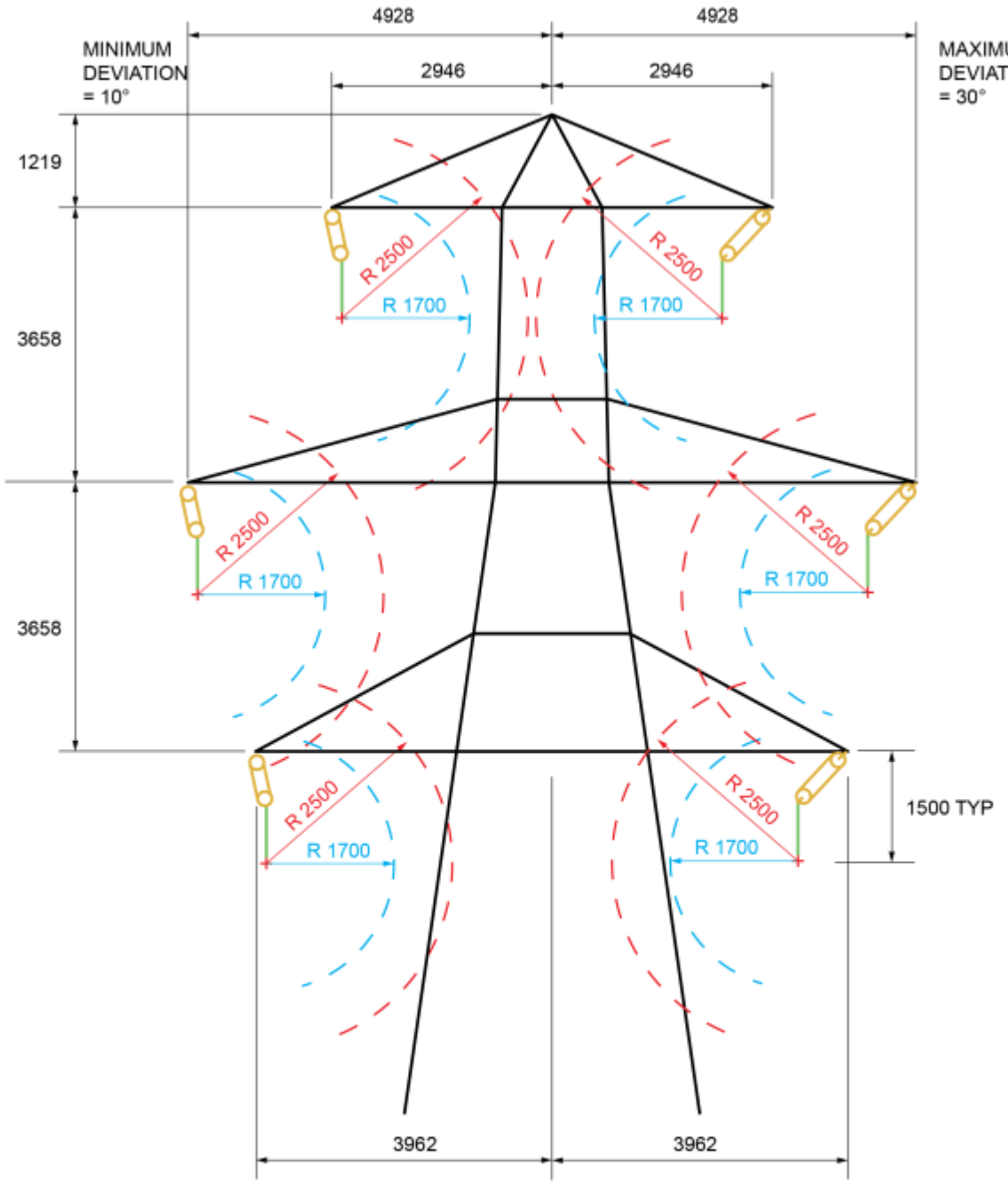


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL1SCD/02

SAFE CLIMBING DIAGRAM FOR NWE PL1 D10 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A5-002 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

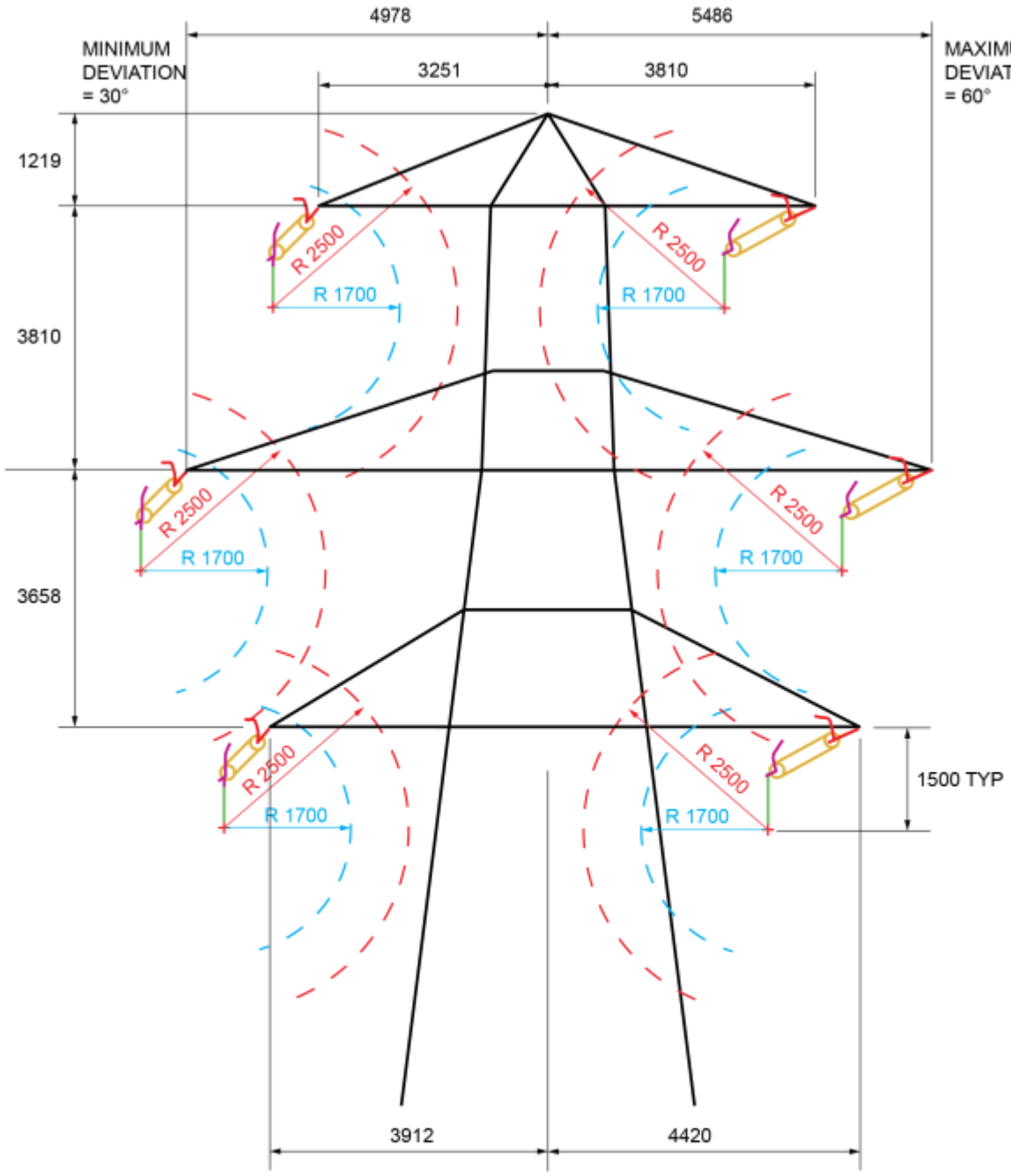


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL1SCD/03

SAFE CLIMBING DIAGRAM FOR NWE PL1 D30 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue N/A	Appears in CP420 Pt 2	electricity north west I-420-2.15A5-003 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

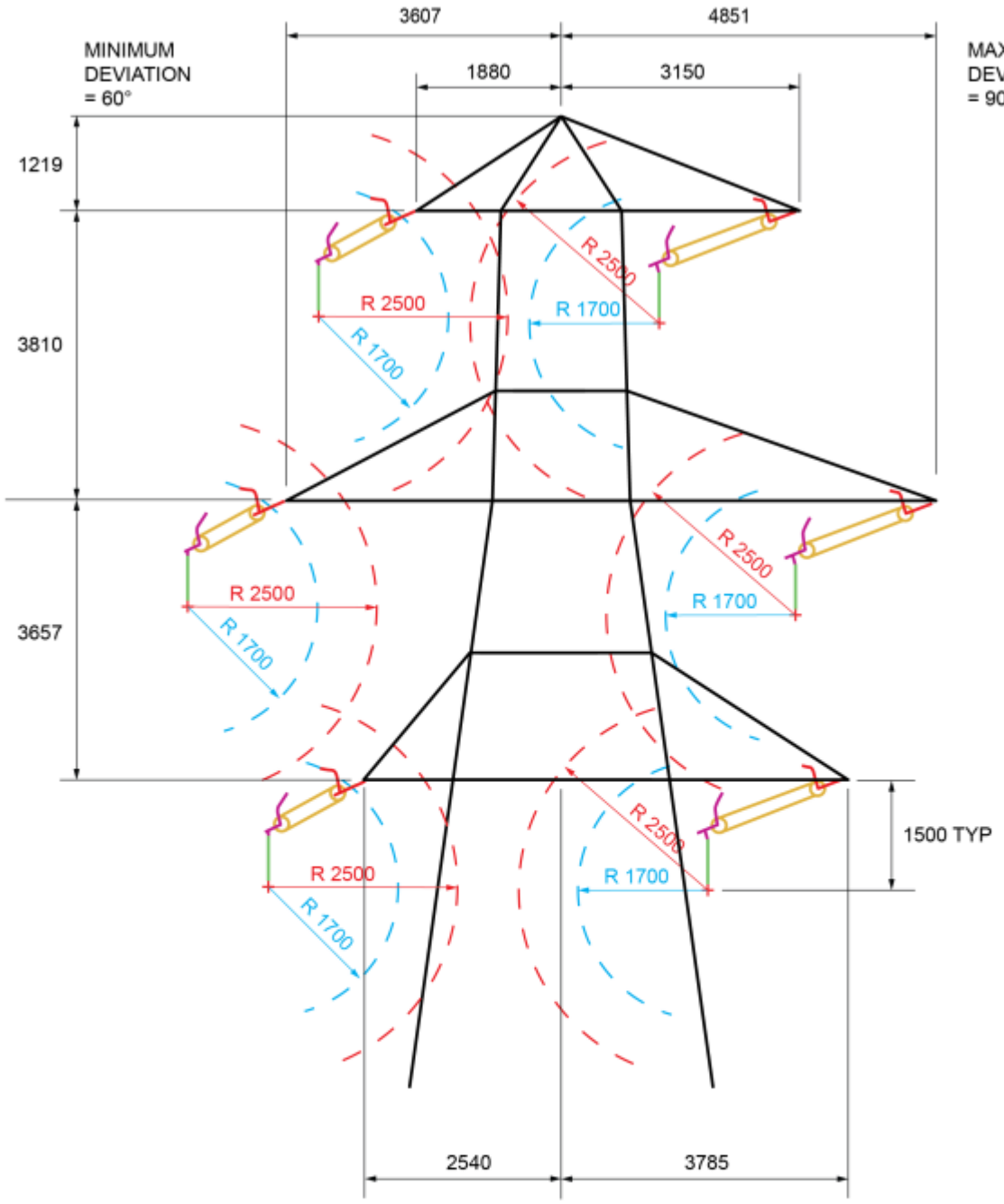


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL1SCD/04

SAFE CLIMBING DIAGRAM FOR NWE PL1 D60 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A5-004 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

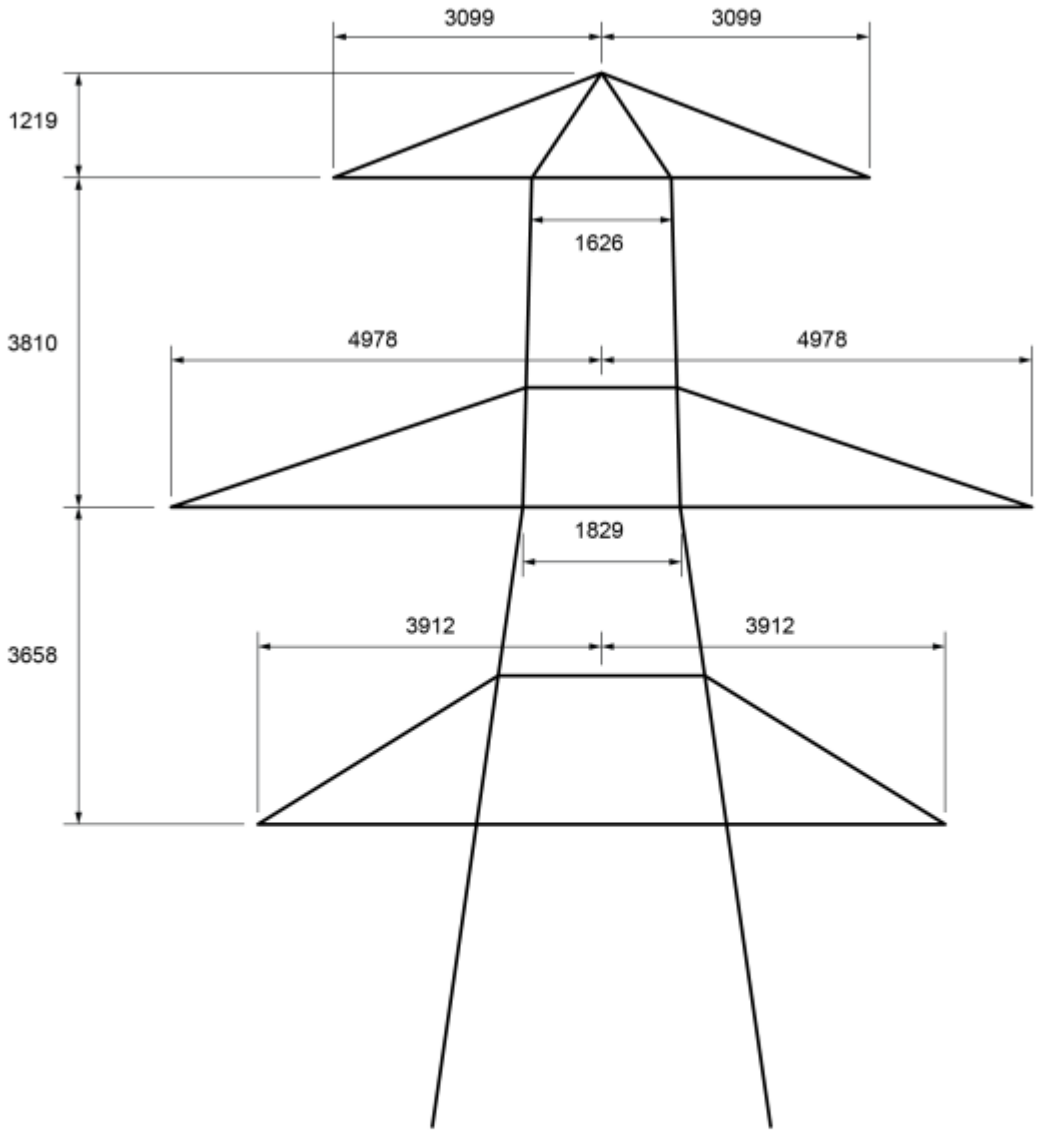


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL1SCD/05

SAFE CLIMBING DIAGRAM FOR NWE PL1 D60 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A5-005 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

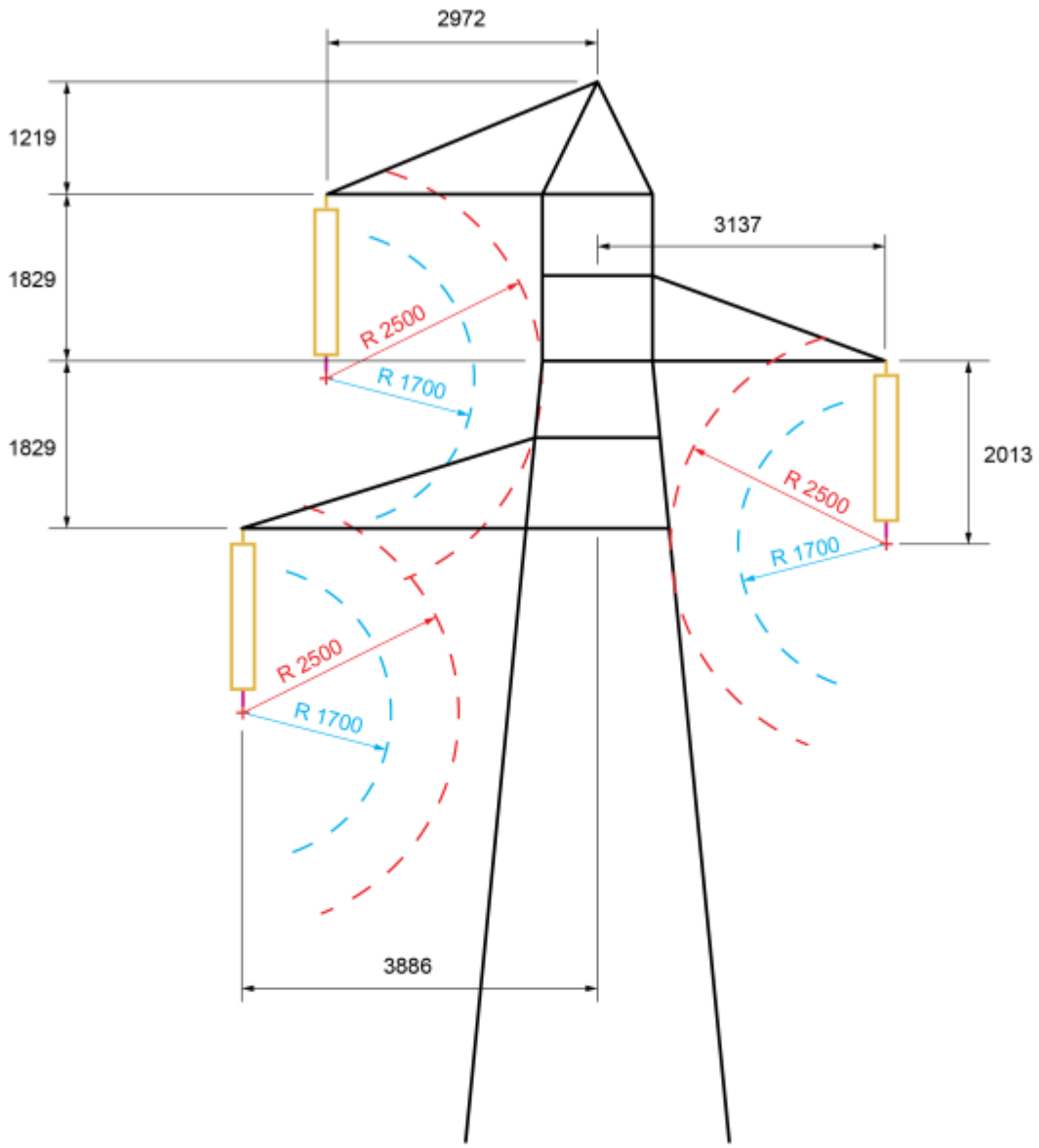


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. This diagram shows outline tower dimensions only. Site specific clearance diagrams to suit actual terminal arrangements are required.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL1SCD/06

SAFE CLIMBING DIAGRAM FOR NWE PL1 DT TYPE TOWER	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A5-006 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

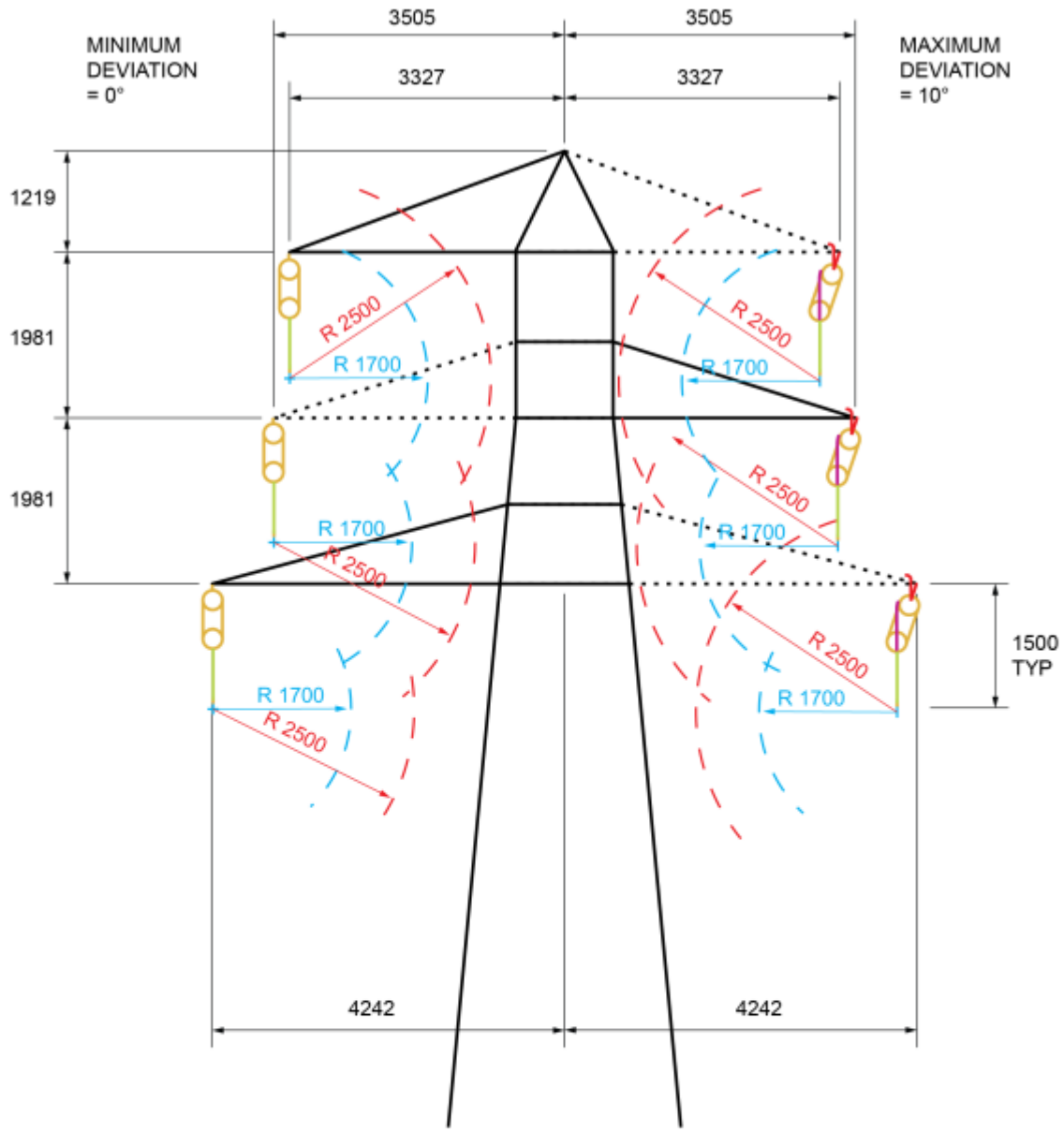


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL1SCD/07

SAFE CLIMBING DIAGRAM FOR NWE PL1 S2 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue N/A	Appears in CP420 Pt 2	electricity north west I-420-2.15A5-007 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

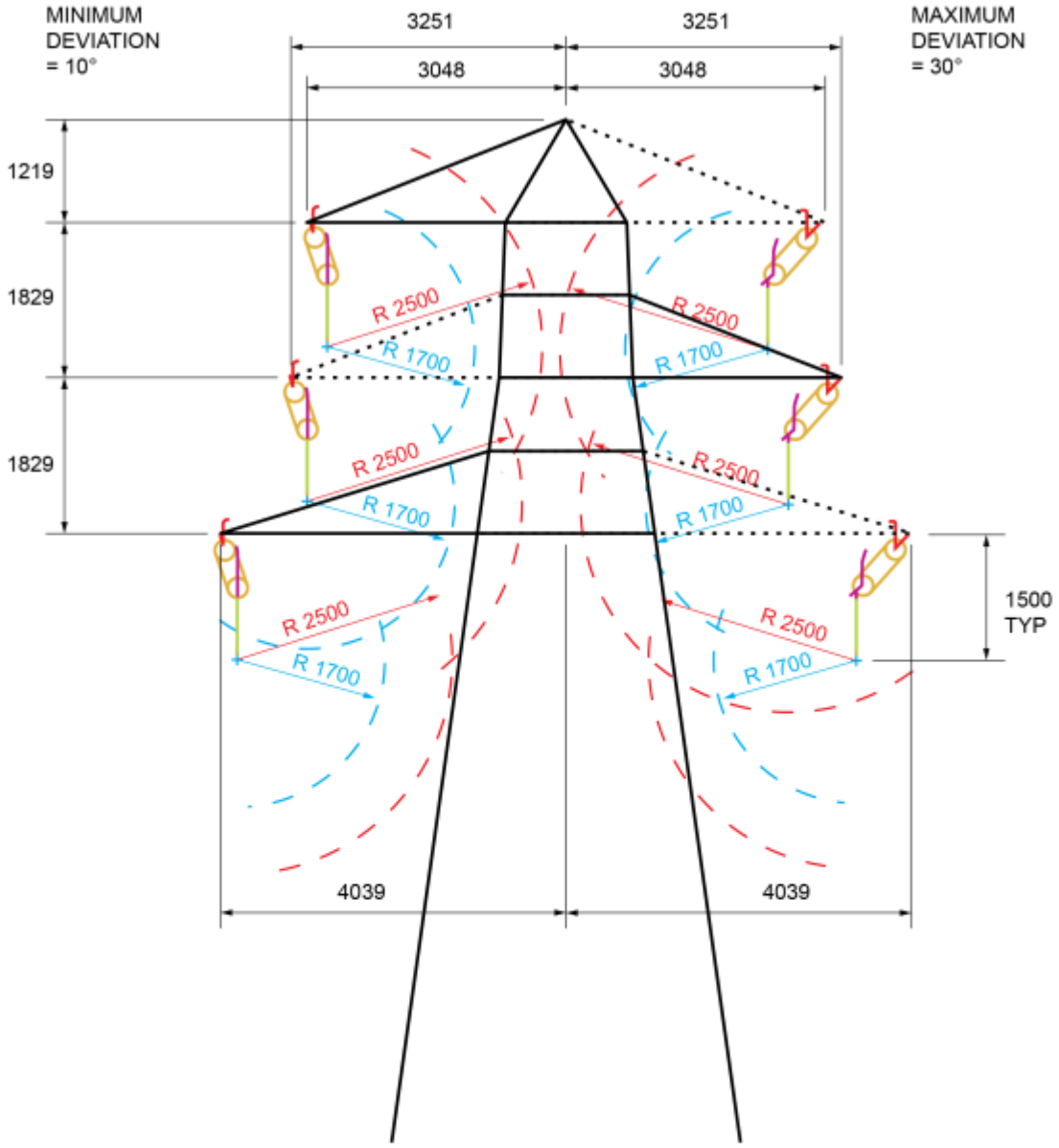


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL1SCD/08

SAFE CLIMBING DIAGRAM FOR NWE PL1 S10 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A5-008 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012



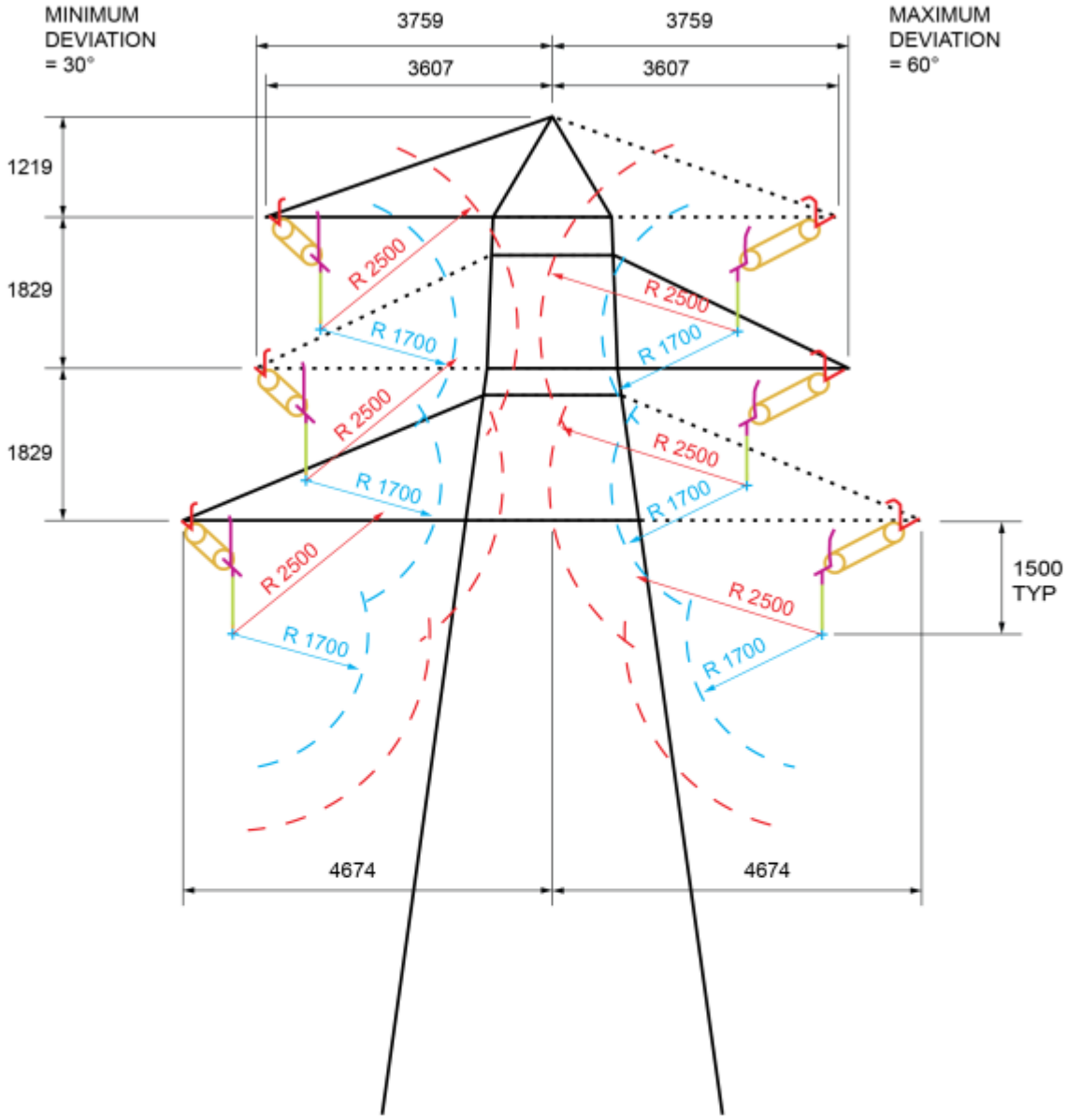
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.
4. Dotted crossarms are to demonstrate max and min angles of deviation on all arms and are not present when tower is constructed.

NOTE:

This drawing is a copy of original CAD Drawing UU/PL1SCD/09

SAFE CLIMBING DIAGRAM FOR NWE PL1 S30 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A5-009 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012



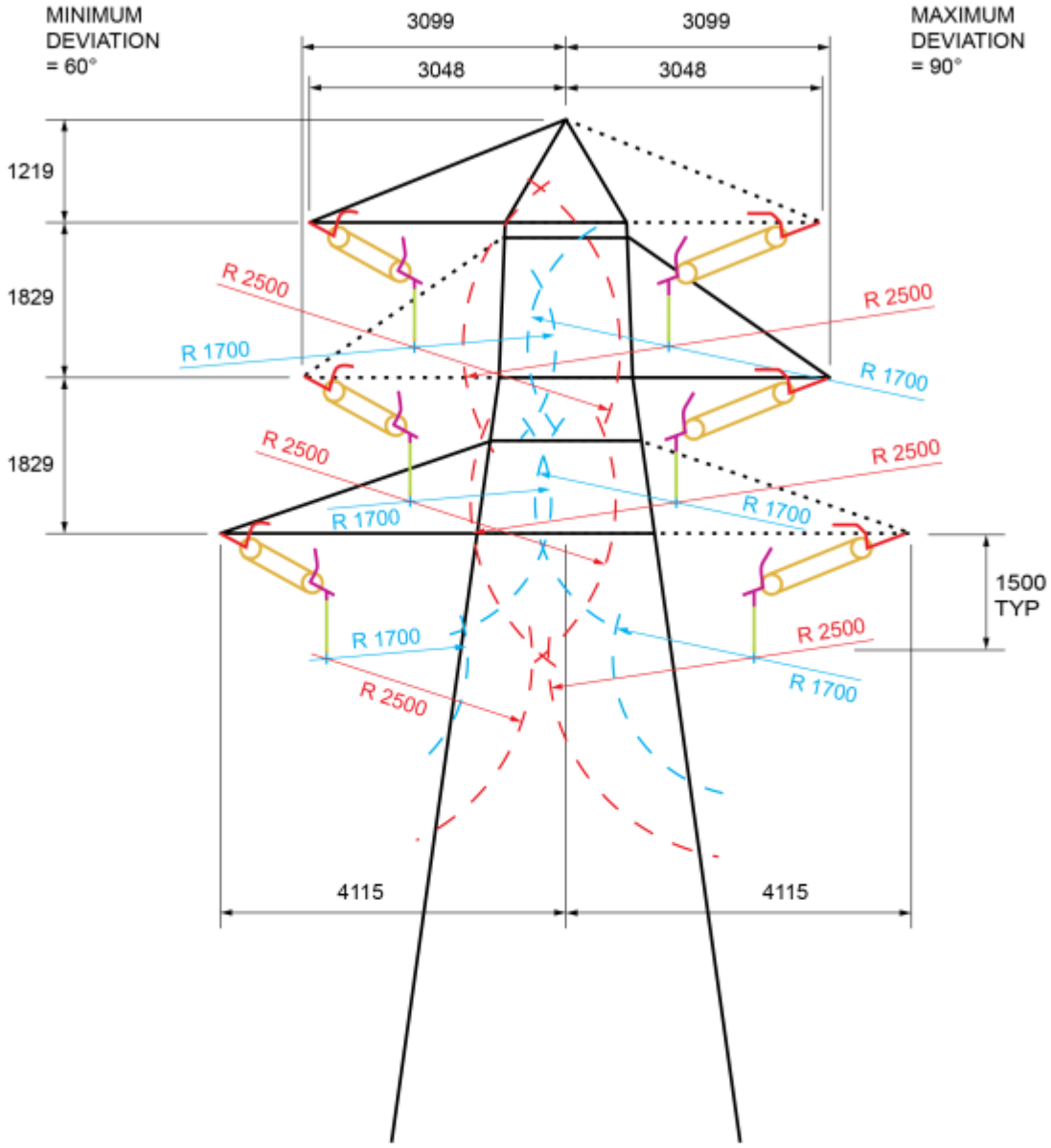
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.
4. Dotted crossarms are to demonstrate max and min angles of deviation on all arms and are not present when tower is constructed.

NOTE:

This drawing is a copy of original CAD Drawing UU/PL1SCD/10

SAFE CLIMBING DIAGRAM FOR NWE PL1 S60 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A5-010 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012



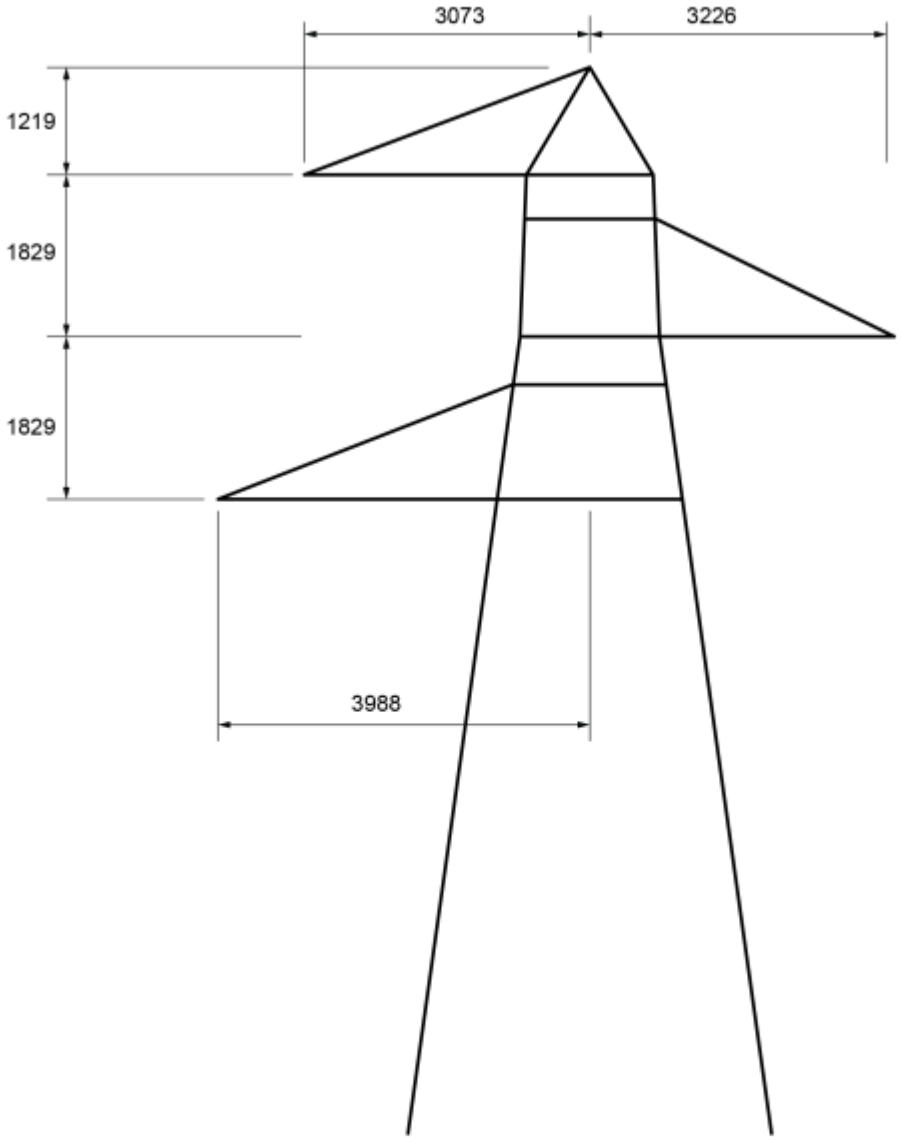
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.
4. Dotted crossarms are to demonstrate max and min angles of deviation on all arms and are not present when tower is constructed.

NOTE:

This drawing is a copy of original CAD Drawing UU/PL1SCD/11

SAFE CLIMBING DIAGRAM FOR NWE PL1 S90 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A5-011 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012

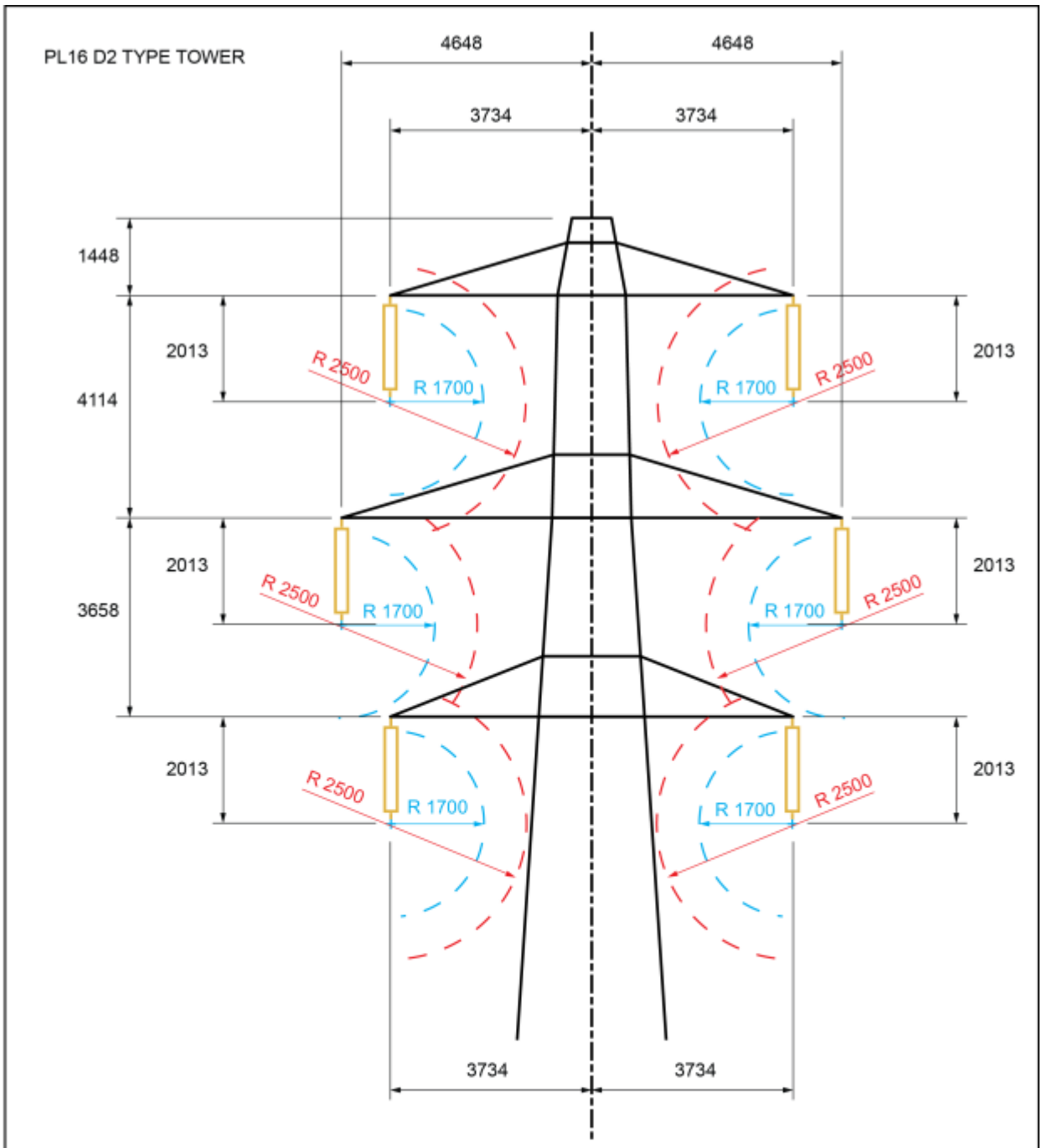


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. This diagram shows outline tower dimensions only. Site specific clearance diagrams to suit actual terminal arrangements may be required.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL1SCD/12

SAFE CLIMBING DIAGRAM FOR NWE PL1 ST TYPE TOWER	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A5-012 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012



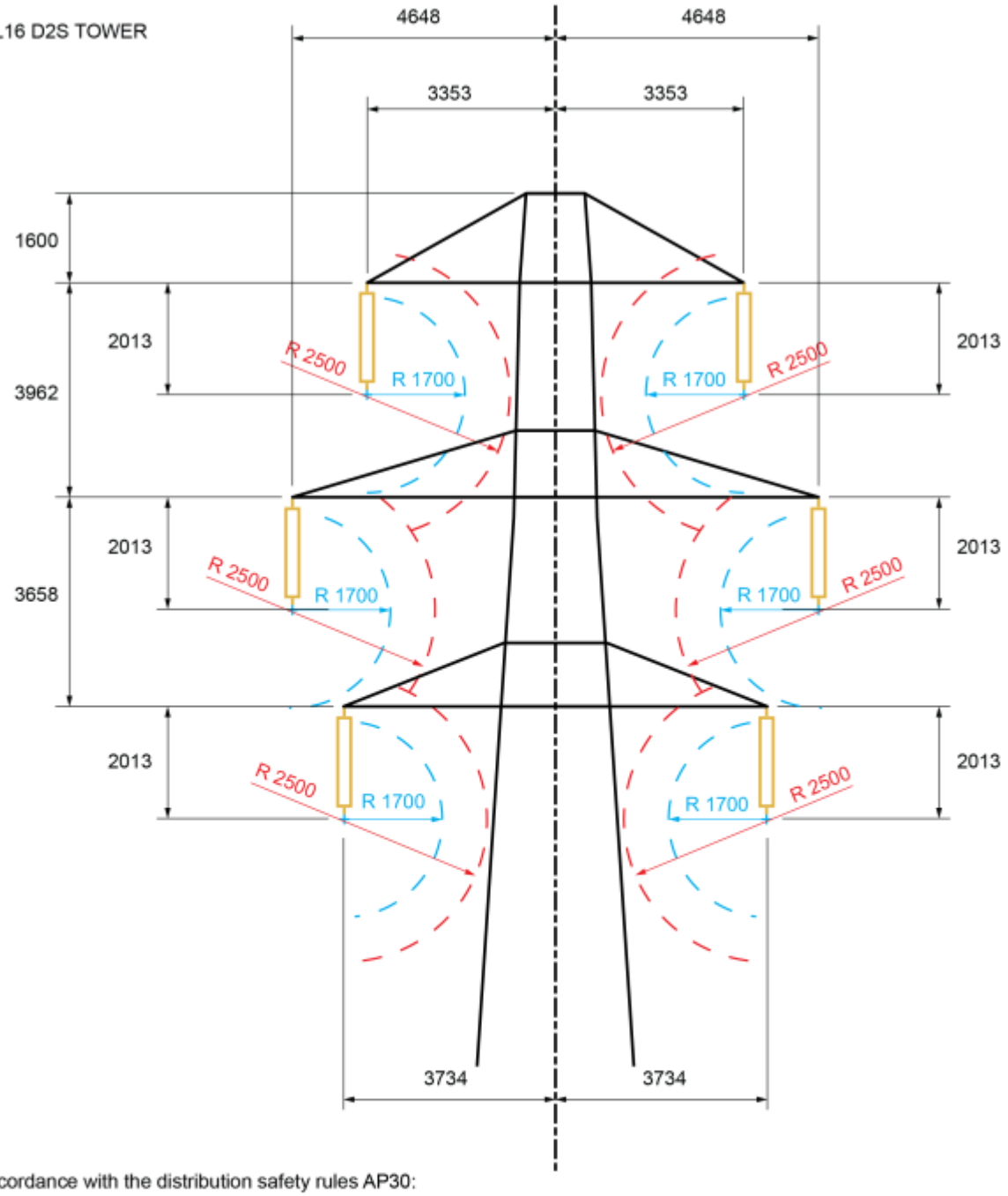
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL16SCD/07

SAFE CLIMBING DIAGRAM FOR PL16 D2 AND D2S TYPE TOWERS, 132kV ARRANGEMENT	Change information for this issue N/A	Appears in CP420 Pt 2	electricity north west I-420-2.15A6-001 Iss 2 sht 1 of 2 Scale: nts Auth: DMT Date: 6/6/2012

PL16 D2S TOWER

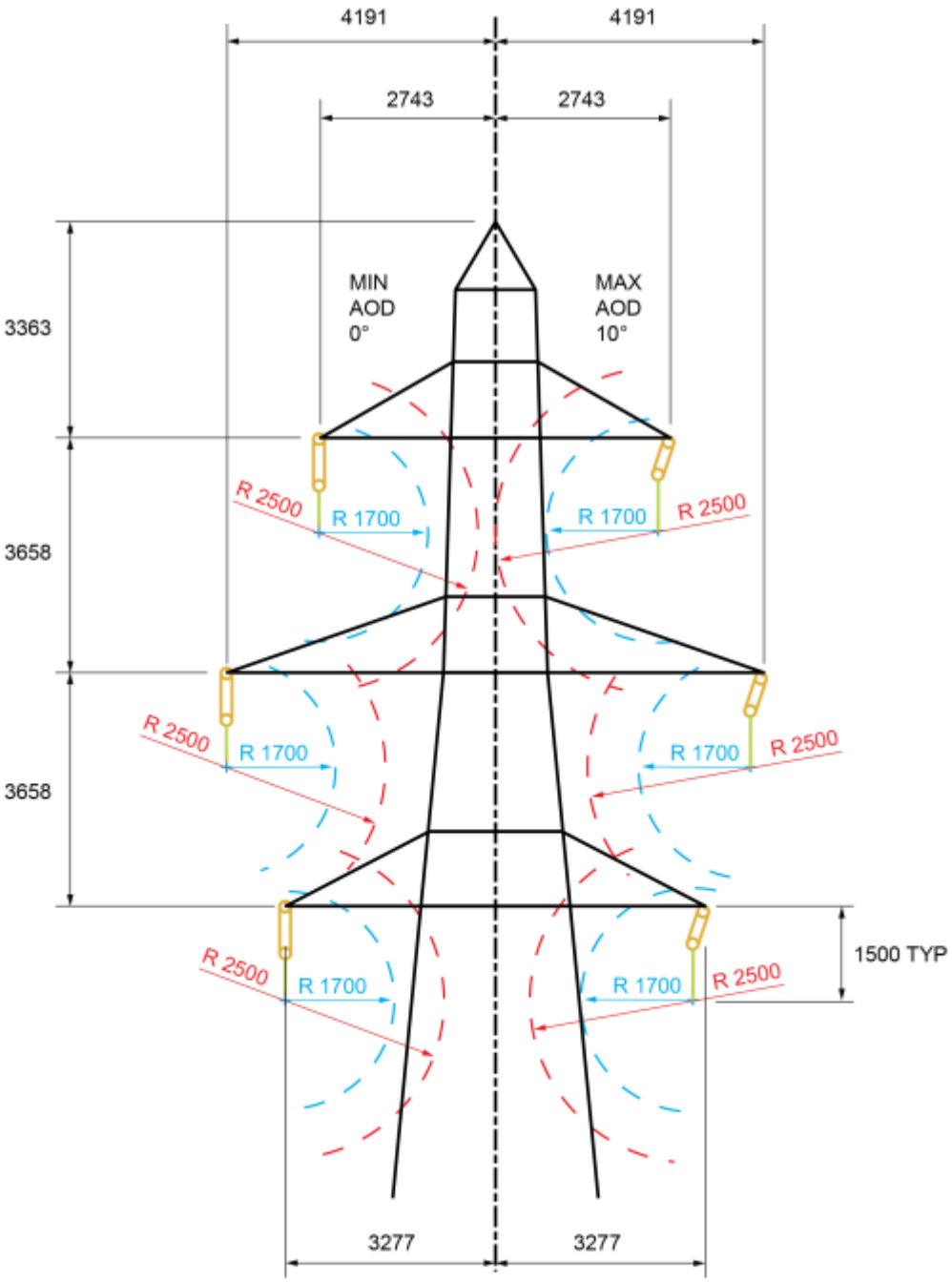


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL16SCD/01

SAFE CLIMBING DIAGRAM FOR PL16 D2 AND D2S TYPE TOWERS, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A6-001 Iss 2 sht 2 of 2 Scale: nts Auth: DMT Date: 6/6/2012

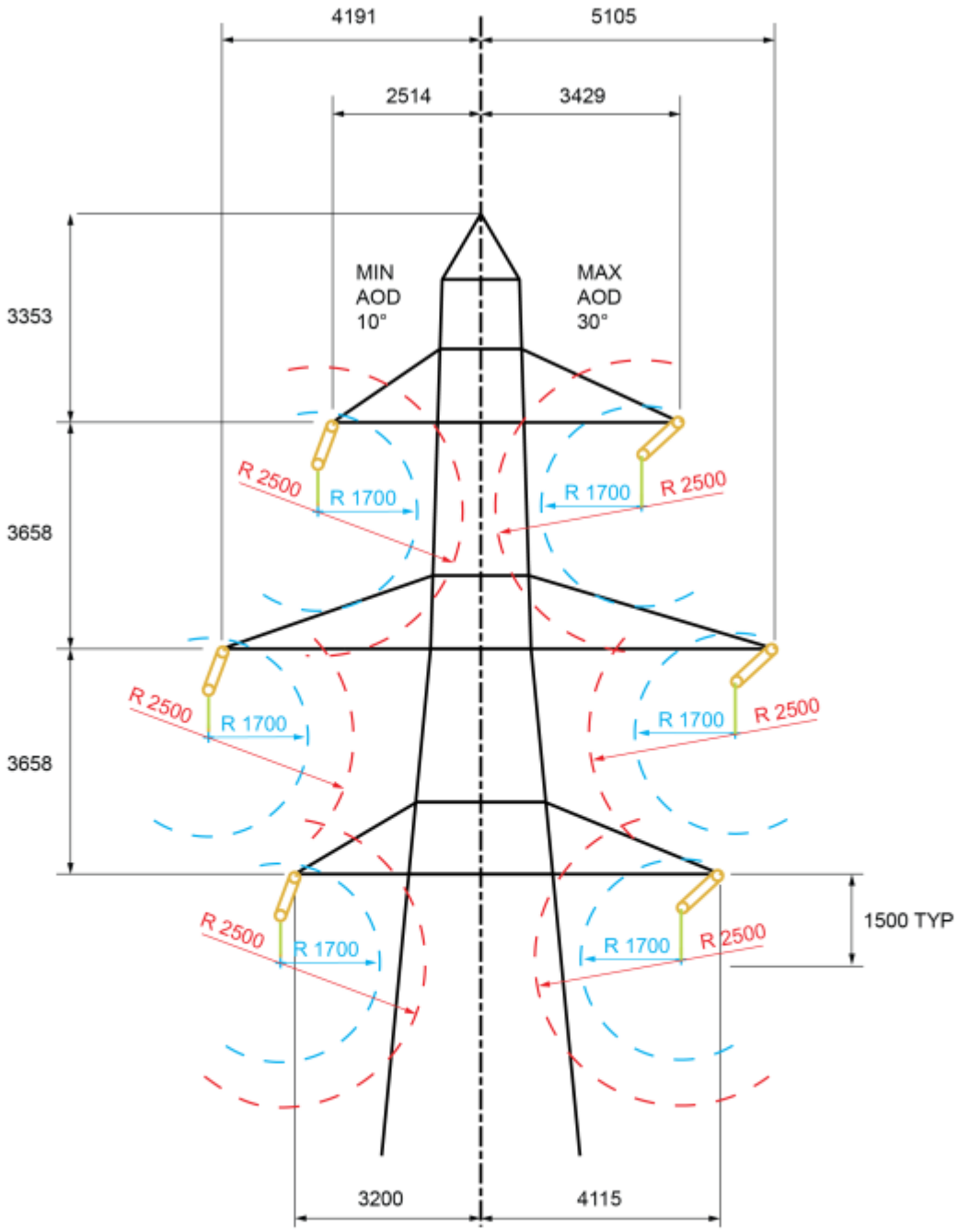


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL16SCD/02

SAFE CLIMBING DIAGRAM FOR PL16 D10 TYPE TOWER , 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A6-002 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

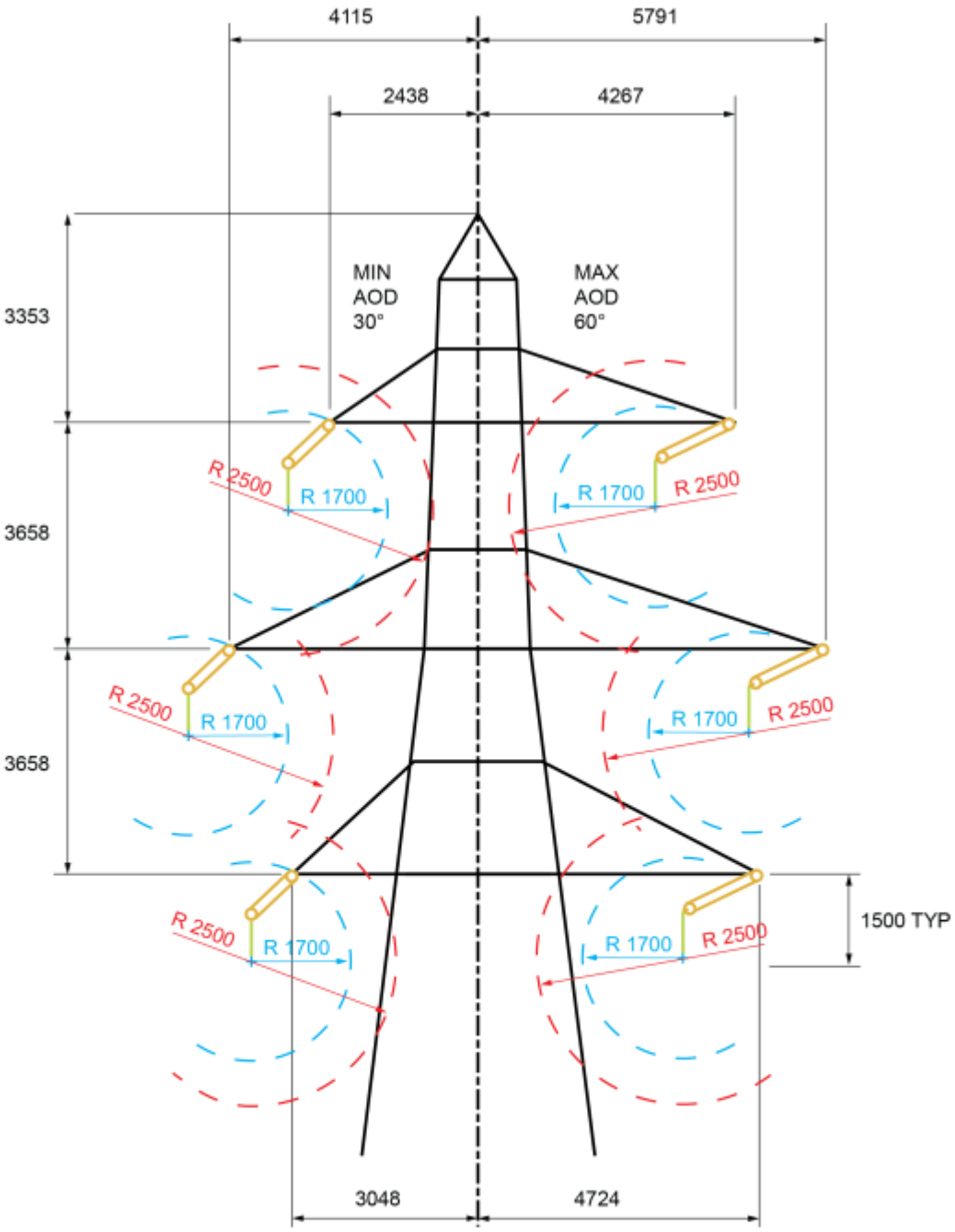


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL16SCD/03

SAFE CLIMBING DIAGRAM FOR PL16 D30 TYPE TOWER , 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A6-003 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

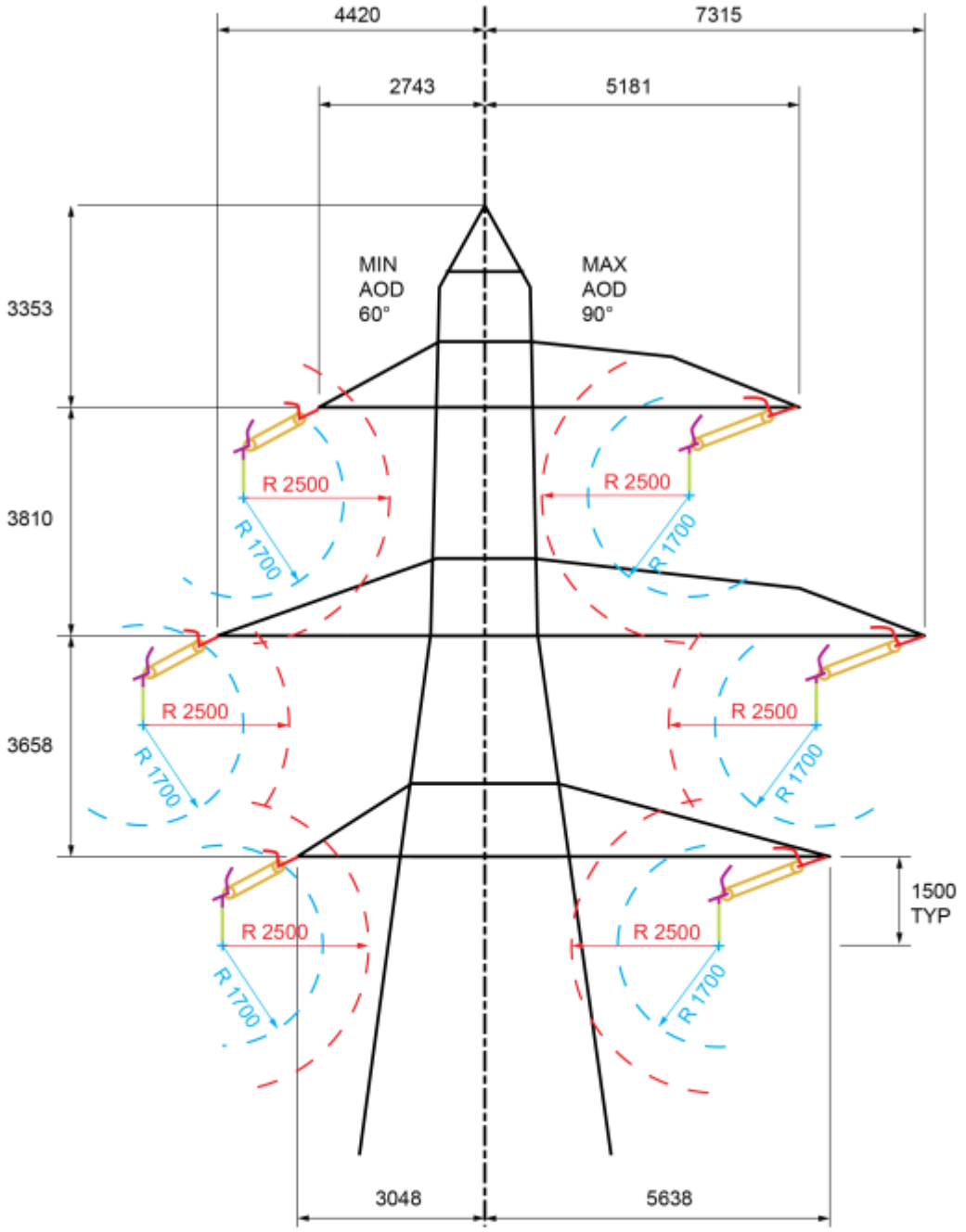


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL16SCD/04

SAFE CLIMBING DIAGRAM FOR PL16 D60 TYPE TOWER , 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west I-420-2.15A6-004 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 6/6/2012

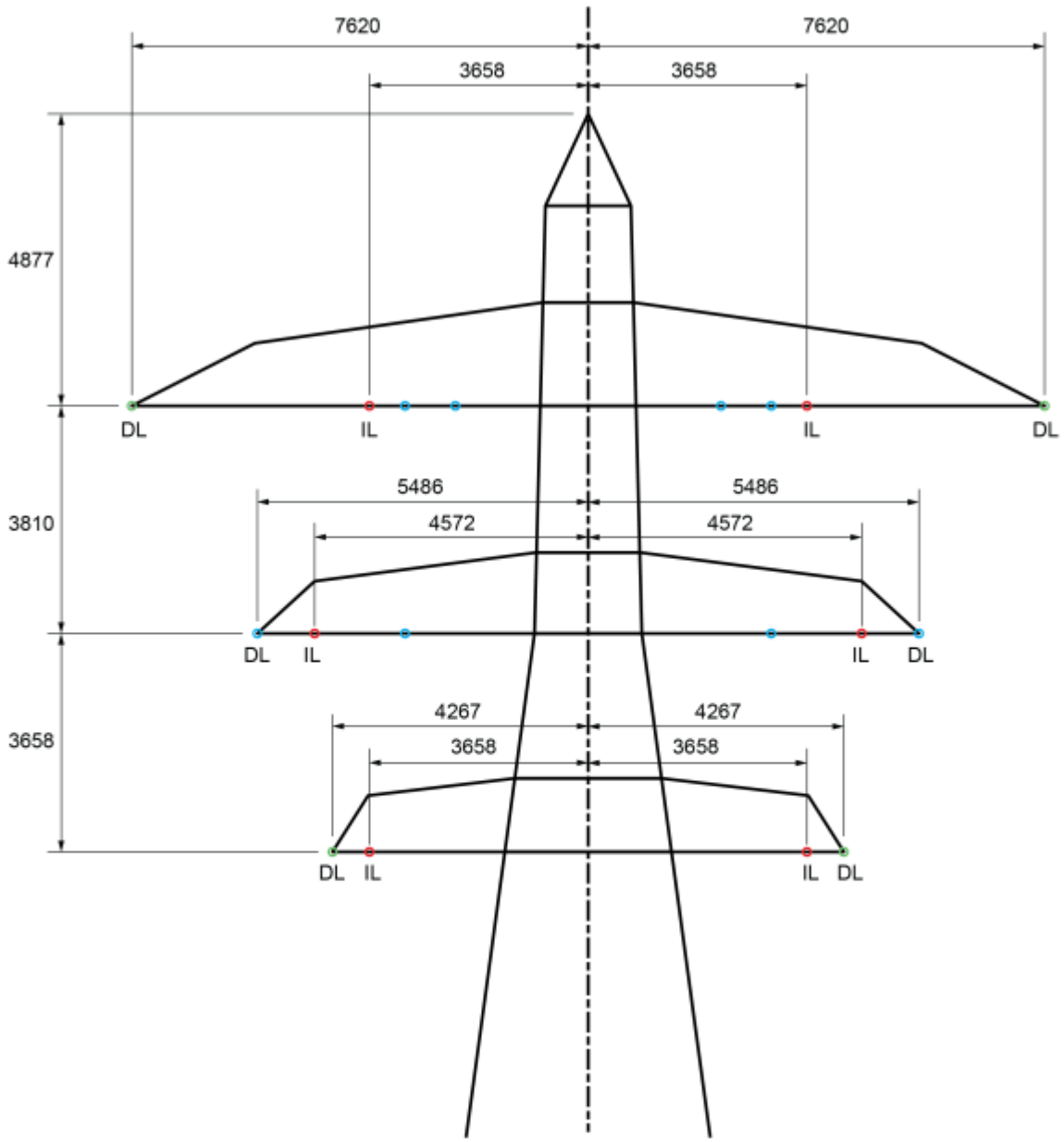


In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. Live conductors are shown in still air position.
3. Jumper depths are typical only.

NOTE:
This drawing is a copy of original CAD Drawing UU/PL16SCD/05

SAFE CLIMBING DIAGRAM FOR PL16 D90 TYPE TOWER , 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A6-005 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012



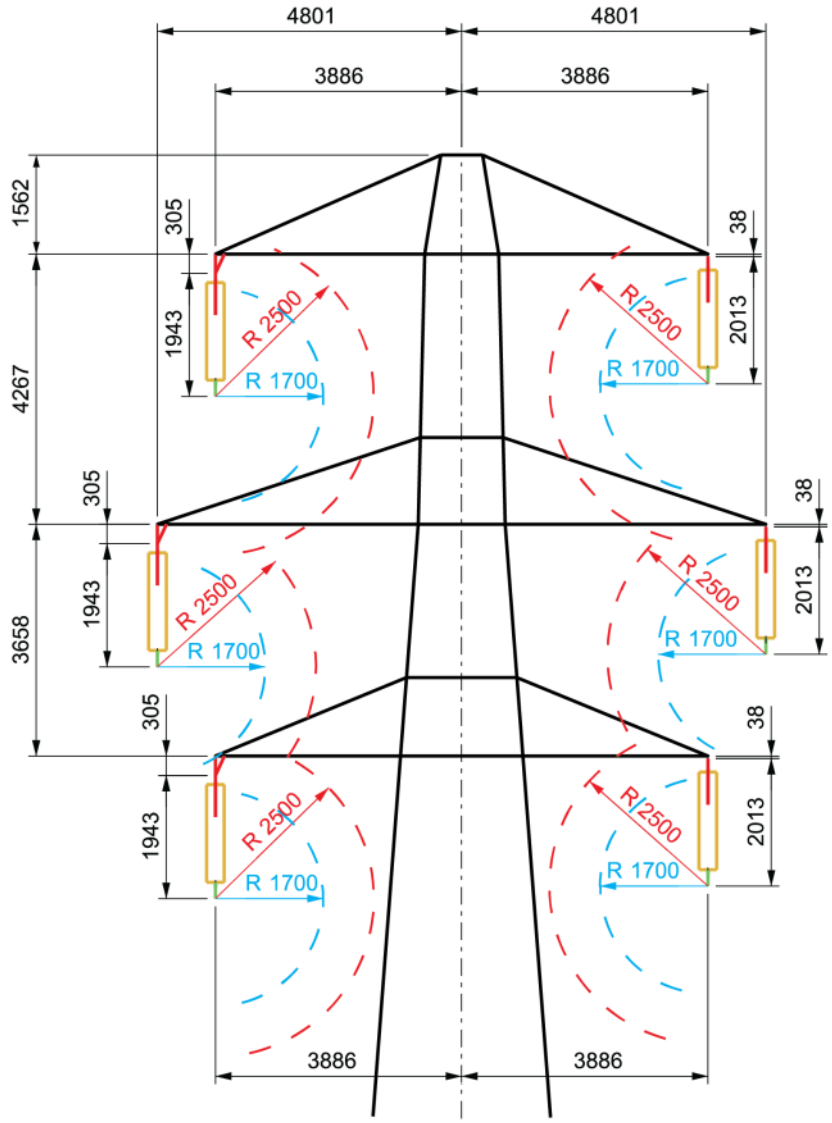
In accordance with the distribution safety rules AP30:

1. When climbing on the outer face (step leg) of the tower, a safe climb distance of 2.5m is required which is derived from a safe working and access clearance @ 132kV of 1.7m plus a human body depth of 0.8m.
2. This diagram shows outline tower dimensions only. Site specific clearance diagrams to suit actual terminal arrangements are required.

NOTE:

This drawing is a copy of original CAD Drawing UU/PL16SCD/06

SAFE CLIMBING DIAGRAM FOR PL16 DT TYPE TOWER , 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A6-006 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 6/6/2012



General notes:

1) A safe climb distance of 2.5m is required, which is derived from a safe working & access clearance of 1.7m + a human body depth of 0.8m.
2) Live conductors are shown in still air position.
3) Left side of diagram depicts suspension sets connected to 'suspension droppers', while right side shows connection to 'suspension brackets'.
4) Tower geometry shown is for single earthwire type tower, as per Watshams Drawing no. 2838c (35/1386)

NOTE:
This drawing is a copy of original CAD Drawing ENW/PL7SCD/D2

SAFE CLIMBING DIAGRAM FOR PL7 D2 TYPE TOWER, 132kV ARRANGEMENT	Change information for this issue: N/A	Appears in: CP420 Pt 2	electricity north west
			I-420-2.15A7-001 Iss 1 sht 1 of 1
			Scale: nts Auth: DMT Date: 8/9/2015