SYSTEM INTERFACES

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User information

This Network Rail standard contains colour-coding according to the following Red–Amber–Green classification.

Red requirements – *no variations permitted*

- Red requirements are to be complied with and achieved at all times.
- Red requirements are presented in a red box.
- Red requirements are monitored for compliance.
- Non-compliances will be investigated and corrective actions enforced.

Amber requirements – *variations permitted subject to approved risk analysis and mitigation*

- Amber requirements are to be complied with unless an approved variation is in place.
- Amber requirements are presented with an amber sidebar.
- Amber requirements are monitored for compliance.
- Variations can only be approved through the national non-compliance process.
- Non-approved variations will be investigated and corrective actions enforced.

Green guidance – *to be used unless alternative solutions are followed*

- Guidance should be followed unless an alternative solution produces a better result.
- Guidance is presented with a dotted green sidebar.
- Guidance is not monitored for compliance.
- Alternative solutions should be documented to demonstrate effective control.

Amendment marks

• First document amendments are presented with a single black line to the right of the affected text.

• Second document amendments are presented with a double black line to the right of the affected text.

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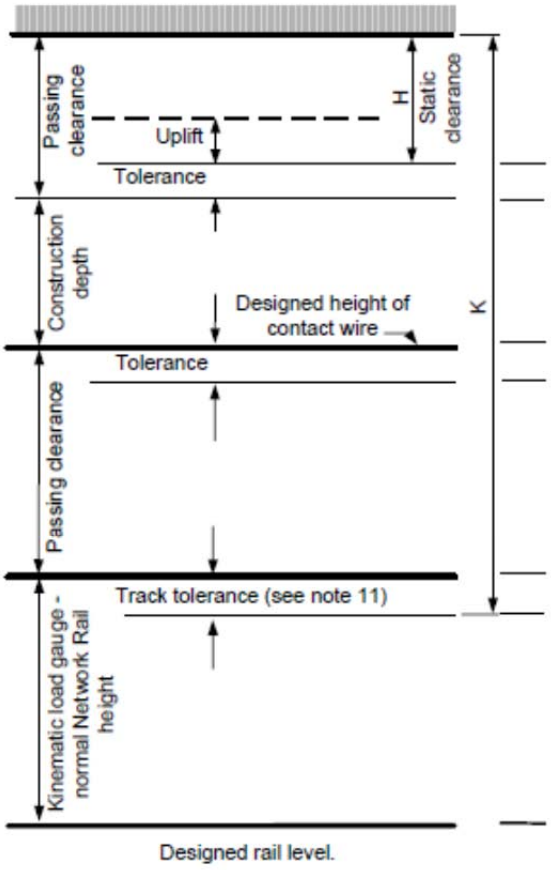
E.1.1: Electrical Clearances - 25 kV



		Column 1	Column 2	Column 3	Column 4
Passing clearance		200 min	200 min	150 min	125 min
Uplift		70	70	50 max	25 max
Tolerance		75	10	10	10
Construction depth		120	120 Note 8	120 max Note 8	115 max Note 8
Tolerance		75	10	10	10
Passing clearance		200 min	200 min	150 min	125 min
Track tolerance (see note 11)		25	15	15	15
Kinematic load gauge - normal Network Rail height		4015	4015	4015	4015
Designed rail level.					
Height of structure above designed rail level	At supports	4780	4640	4520	4440
	Between supports (see note 8)	4780	4545	4425	4350
Designed height of contact wire above designed rail level		4315	4240	4190	4165
Static clearance, H		270 (min)	270 (min)	200 (min)	150 (min)
Depth, K		765	625	505	425

Where different load gauges, construction depths or uplifts apply, appropriate adjustments shall be made. In columns 2 and 3 the construction depths **may** be reduced and in column 4 shall be reduced between supports giving appropriately lower structure heights

NOTES

1. Column 1 - Normal clearances with full tolerances.
2. Column 2 - Normal clearances with close tolerances
3. Column 3 - Reduced clearances
4. Column 4 - Special reduced clearances.
5. All dimensions are in millimetres.
6. Column 1 gives the recommended height for new or reconstructed structures.
7. Where the height of a structure lies between two of the limits shown in the columns above, the additional clearance should be used to increase electrical clearances before increasing construction depth/uplift tolerances
8. The dimensions given relate to straight and level track and allowance should be made for the effects of vertical and horizontal curvature, including cant, in order to maintain the required clearances.
9. For ease of presentation, the track tolerance is shown above the kinematic load gauge rather than below it.

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E.1.2: Design of Layouts for 25kV Overhead Electrified Lines - 1

NB: Designers are advised to seek specialist advice at the earliest stage of a project. However, the following general information may be of assistance:-

Relationship between S&C switches and Overhead Structures

The standard design for overhead electrification requires a supporting structure to be located at a position along the track where the dimension Y (shown in the diagram below) measured between running edges is:

150mm minimum, 200mm desirable, 380mm maximum.

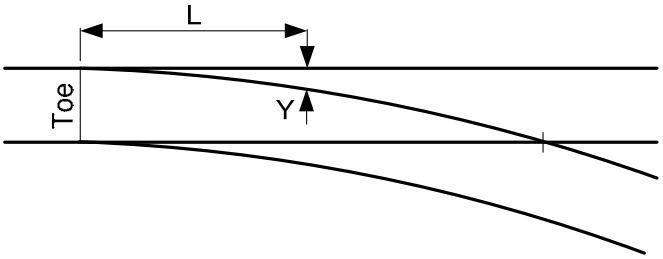

Table 1 – Design of Layouts for 25kV Overhead Electrified Lines

Type of Switch	Length L = Switch toe to opening position Y		
	Minimum, Y = 150	Desirable, Y = 200	Maximum, Y = 380
CEN56E1 Vertical S&C			
AV	496	596	880
BV	585	700	10
CV	697	829	12
DV	836	990	14
EV	11	13	19
FV	13	16	24
SG	16	19	27
GV	18	22	31
HV	27	31	44
NR60 Inclined S&C			
NR60	787	906	12
NR60	906	10	14
NR60	11	13	18
NR60	15	17	23
NR60S	19	22	30
NR60	22	25	35
NR60	29	34	47

NOTES

1. All dimensions are in millimetres.
2. If the above criteria cannot be met, discussion with the OLE designer will be required.
3. Continued on sheet E.1.3

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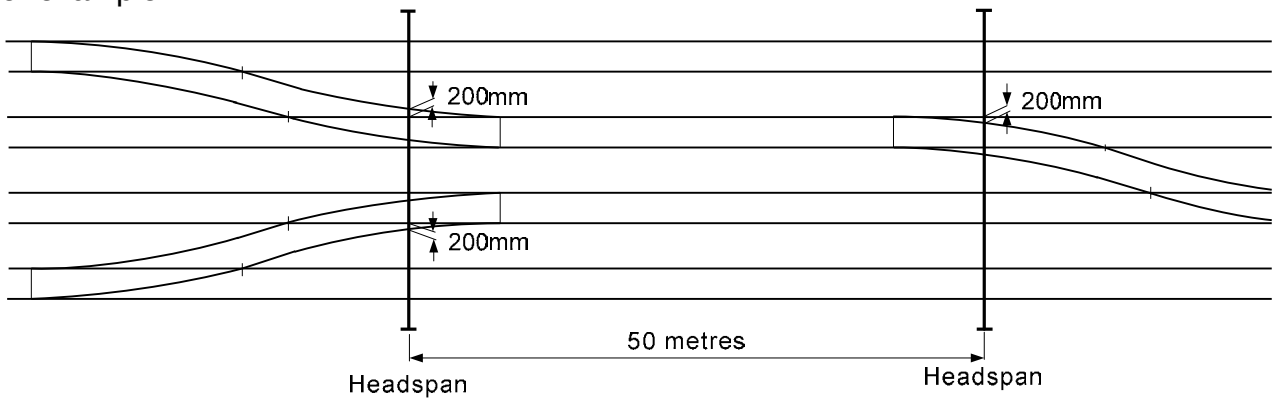
E.1.3: Design of Layouts for 25kV Electrified Lines - 2

Having satisfied all permanent way design parameters, the location of S&C, to give desirable mast positions, can be applied as follows:-

1. A distance of 50 metres is to be applied between the desirable 200mm running edges opening point for follow- on switches.
2. Where headspans are to be provided, the 200mm running edges opening points are to be located in line across, where possible

For example:



Location of S&C in relation to Overbridges

If the switch toe of any turnout can be located at a distance greater than 50 metres from the nearest face of an overbridge, this should result in no design problems for the overhead wiring.

This distance can be reduced but consultation is advised with the OLE designer at this stage.

Location of S&C in relation to Level Crossings

The location of S&C within 600 metres either side of a level crossing should be avoided, and only adopted after consultation with the OLE designer.

Overhead clearances

All bridge, tunnel and awning profiles where lines are to be electrified should be made available to the OLE designer at the earliest possible stage, preferably at 1:20 scale.

Track intervals

In designing new multi-track layouts for electrified lines, a track interval of 3800mm (R.E.s) will provide sufficient clearance for overhead support structures to be erected in that interval.

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