LM8 Work functionality

Special considerations for Bane NOR infrastructure

Project LM8

About this document

- The purpose of this document is to point out where the Bane NOR infrastructure and catenary system might differ from catenary systems in other european countries.
- The differences could affect the choise of type and combination of lifts, cranes and other equipment on the catenary car.
- This document does not intend to point out a required solution for the new vehicle, but to be a remainder of the special situations on Bane NORs catenary system.

Background

- On several locations the lower insulator on the catenary cantilever is too low to be handled from the roof workspace. In most narrow tunnels there is also not enough space sideways to use the lift.
- In old narrow tunnels, at stations, on sidetracks and parts of the main track, masts and other high mounted objects can be placed near to the vehicle dynamic profile.
- The power supply lines for the catenary systems with autotransformers are mounted on top of the catenary masts on insulators. The supply lines and their insulators shall be handled by the vehicle. In many places on the old lines the power line is at 4,7 meters from TOR.
- Power return lines are often mounted on the back of the catenary masts and shall be handled by the vehicle.

Proximity to infrastructure objects

The figure shows the limits for the proximity to masts and other objects for the profiles A-85, A-96 and A-C.

$a_i = 2520 + K_i + 2{,}3 \cdot h$

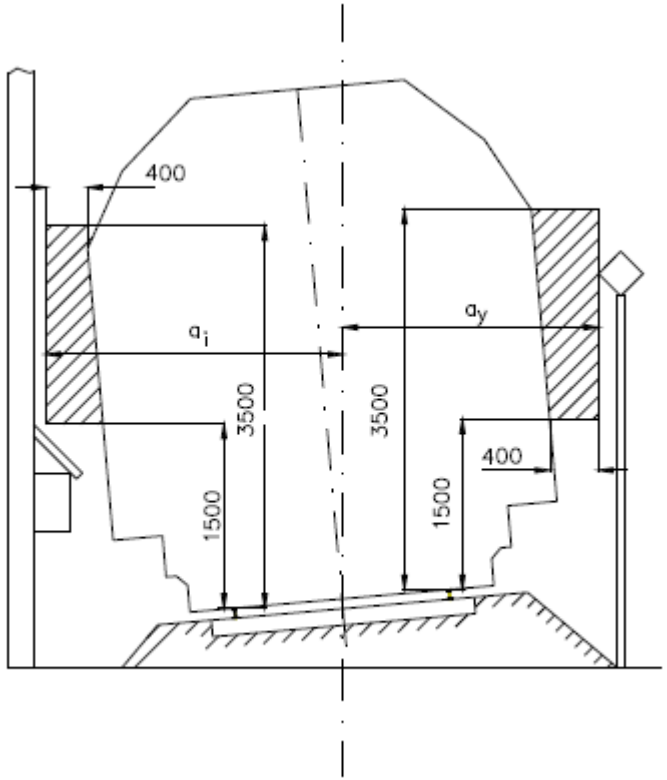
$a_y = 2520 + K_y - h$

Where:

K_i = inner curve deflection

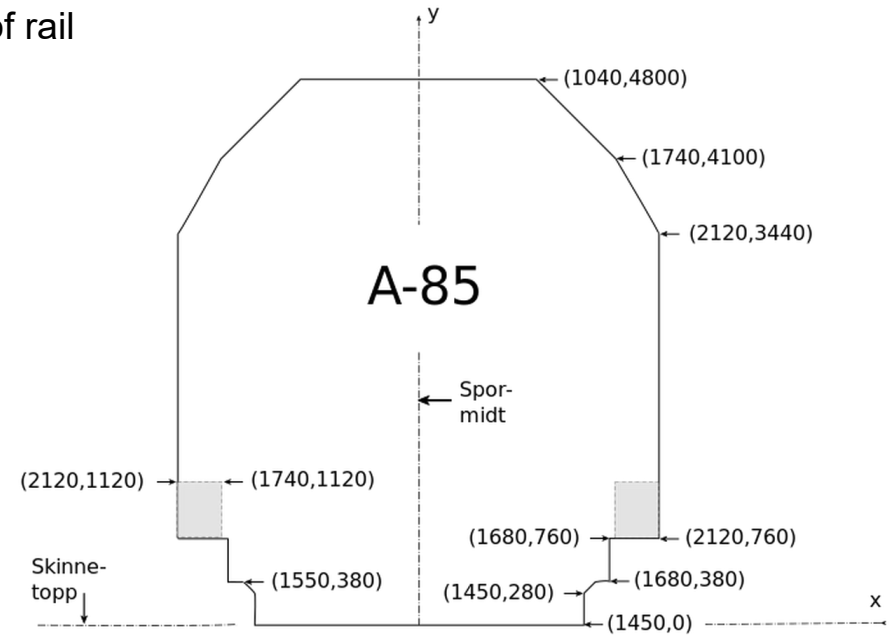
K_y = outer curve deflection

h = superelevation (<=150mm in Norway)

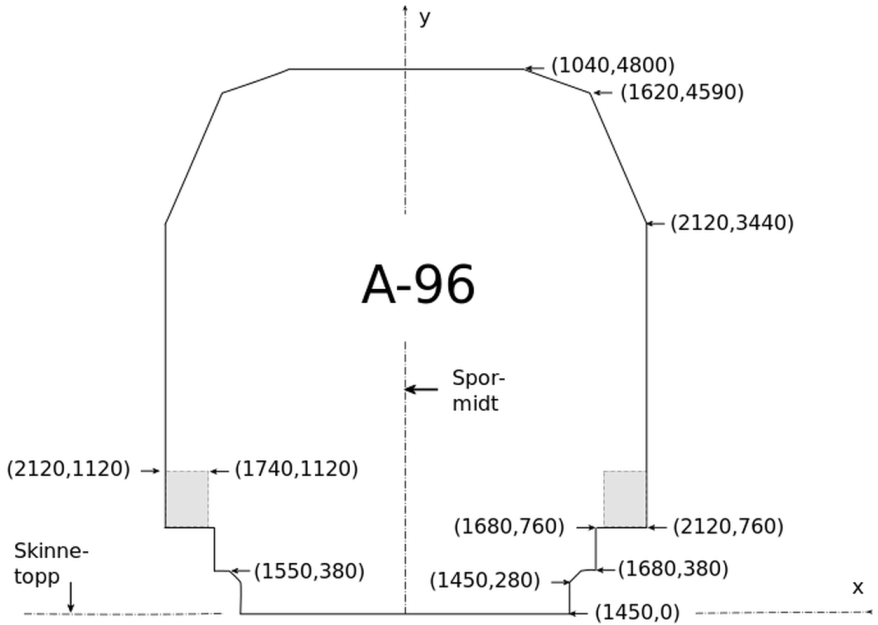


Provile A-85 = The narrowest tunnel profile

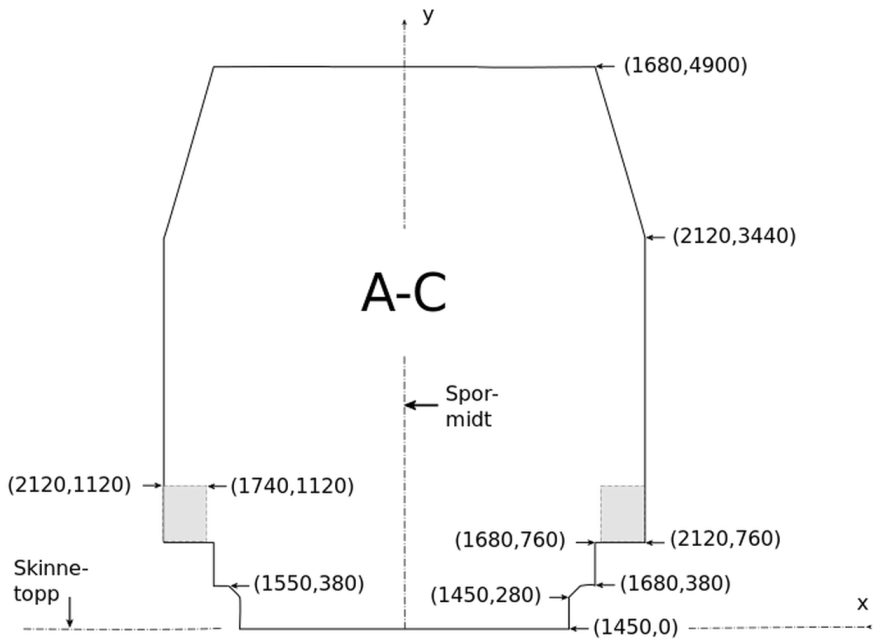
- Spor-midt = track center.
- Skinnetopp = top of rail



Profile A-96


y
(1040,4800)
(1620,4590)
(2120,3440)
A-96
Spor-
midt
(2120,1120)
(1740,1120)
(1680,760)
(2120,760)
Skinne-
topp
(1550,380)
(1450,280)
(1680,380)
x
(1450,0)

Profile A-C


y
(1680,4900)
(2120,3440)
A-C
Spor-
midt
(2120,1120)
(1740,1120)
(1680,760)
(2120,760)
Skinne-
topp
(1550,380)
(1450,280)
(1680,380)
x
(1450,0)

All profiles in comparison

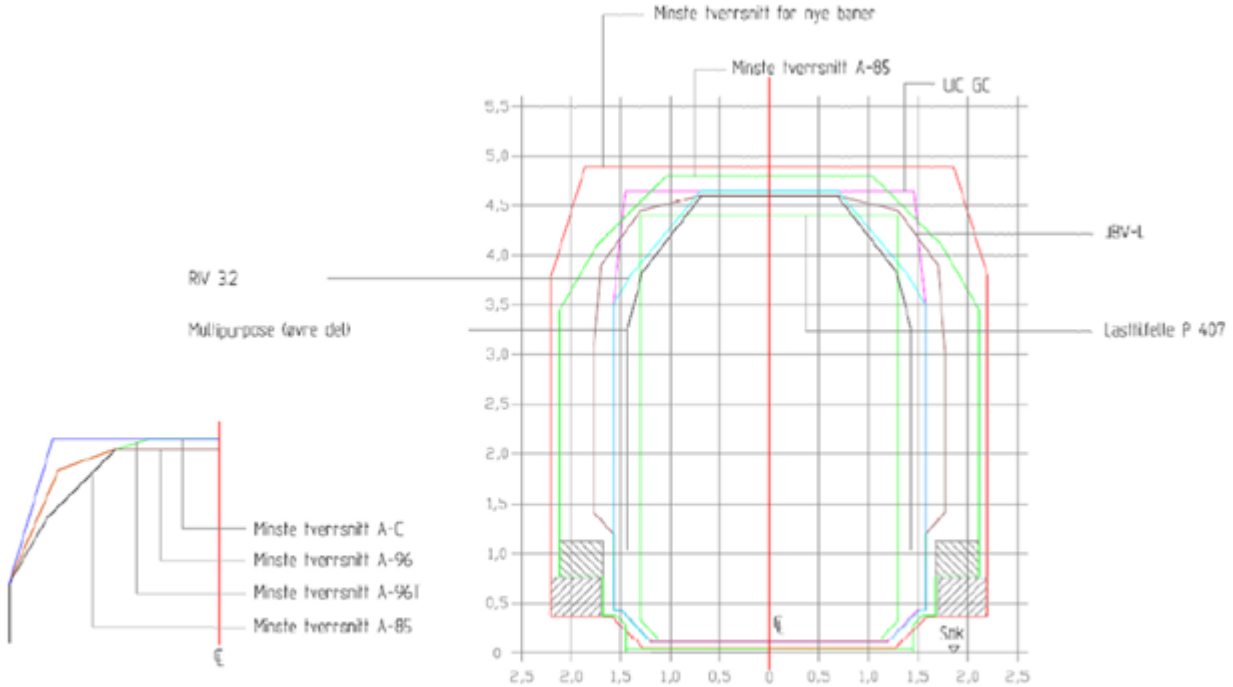
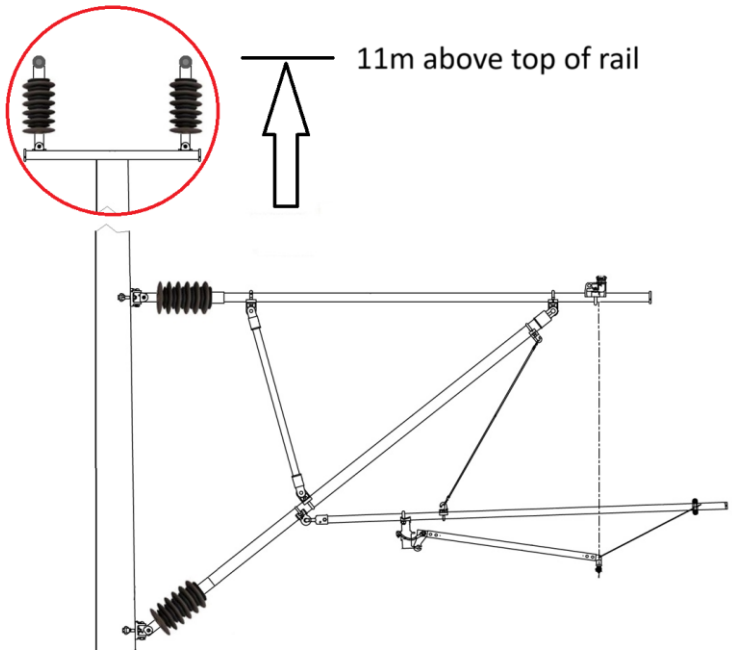
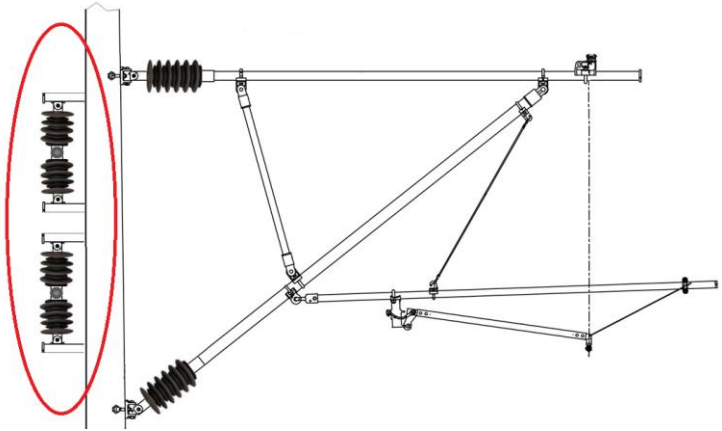


Figure 2: Compilation of profiles, shows the minimum cross section "minste tverrsnitt" A-85.

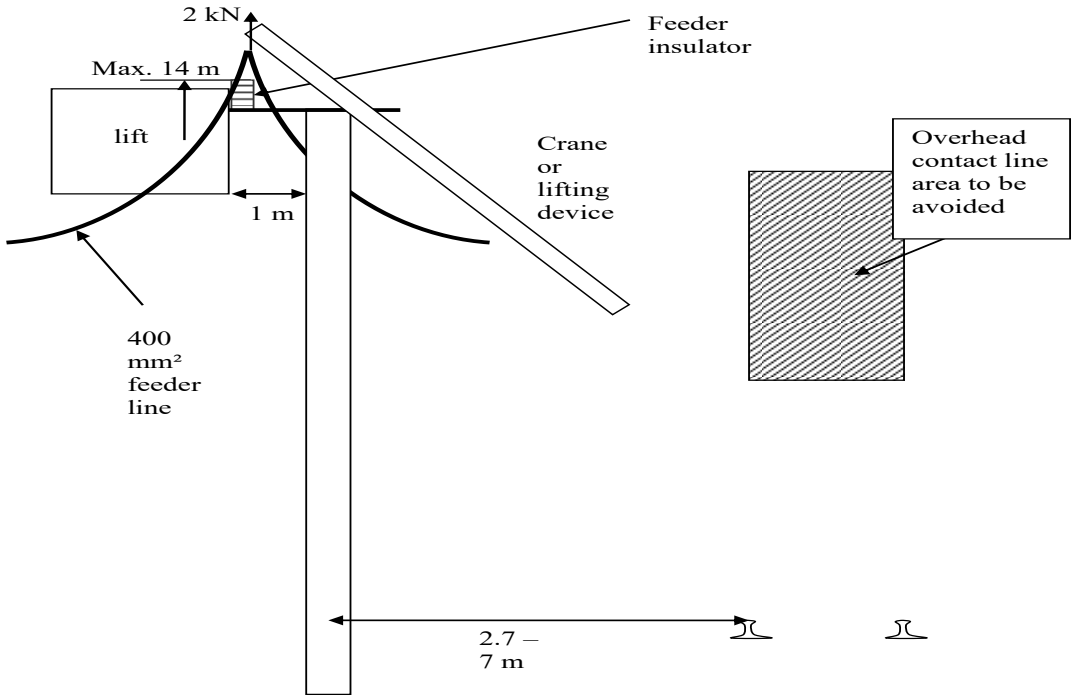
AT-lines on top of masts



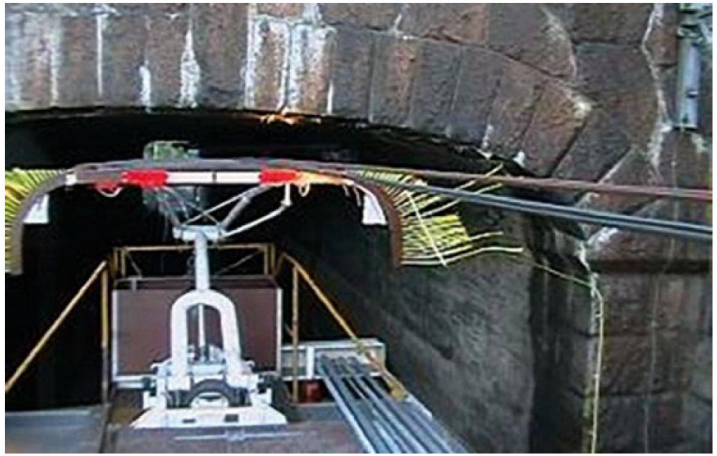
Power return lines on backside of mast



AT installation on free line



Example of narrow tunnel



The overhead contact line system typical in Norway

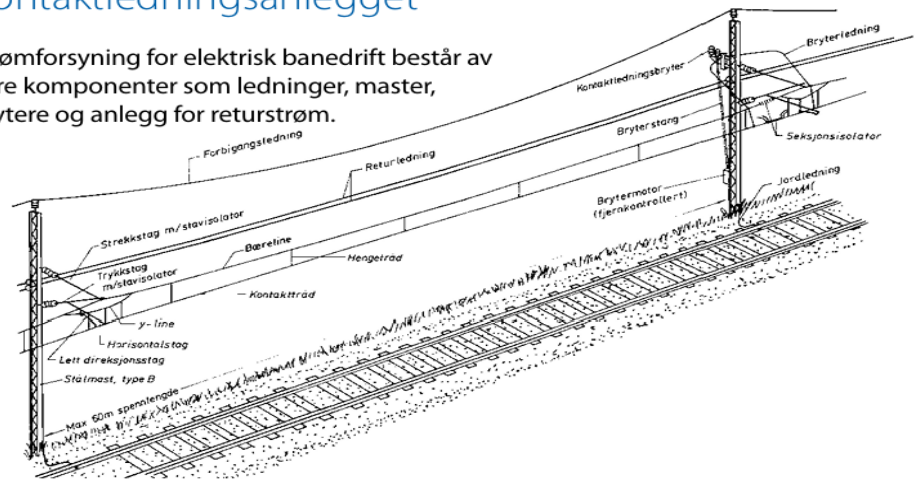
The power supply for electric railway operation consists of several components such as conductors, masts, switches, and installations for return current.

The diagram illustrates a typical overhead contact line system for electrified railways, showing the mechanical support structure, electrical conductors, switching equipment, and grounding arrangements necessary for safe and reliable power supply to trains.

Fakta

Kontaktledningsanlegget

Strømforsyning for elektrisk banedrift består av flere komponenter som ledninger, master, brytere og anlegg for returstrøm.



Unofficial translation to english

Norsk betegnelse	Engelsk oversettelse
Forbigangslinjeledning	Passing line feeder
Returledning	Return conductor
Strekkstag m/stavisolator	Tension rod with post insulator
Trykkstag m/stavisolator	Compression rod with post insulator
Bæreline	Messenger wire
Hengestråd	Dropper
Kontakttråd	Contact wire
Y-line	Y-line
Horisontalstag	Horizontal brace
Lett drivisingsstag	Light anti-icing brace
Stilmaster, type B	Steel mast, type B
Maks 60 m spennlengde	Max. 60 m span length
Kontaktledningsbryter	Overhead line circuit breaker
Bryterstang	Switch operating rod
Bryterledning	Switch conductor
Seksjonsisolator	Section insulator
Brytermotor (fjernkontrollert)	Switch motor (remote-controlled)
Jordledning	Earth (ground) conductor