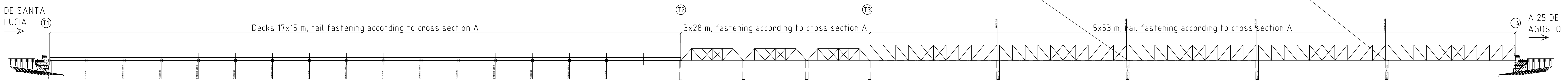
The entire bridge area and
abutments are made as a continuos
welded track

Rail neutral temperature area
+27-33 °C
axle load 22,5 tons, design maximum speed 80 km/h
volume of traffic: 4 million grosstonnes/year

To the each expansion joints will
be made joint gap to the guard rail

Maximum possible fracture gap
$\Delta T = -5-(+55)$
$T_n = 27-33$ °C, $L \times \alpha \times \Delta t$,
53 m x 0,000012 x 38 °C= 24 mm

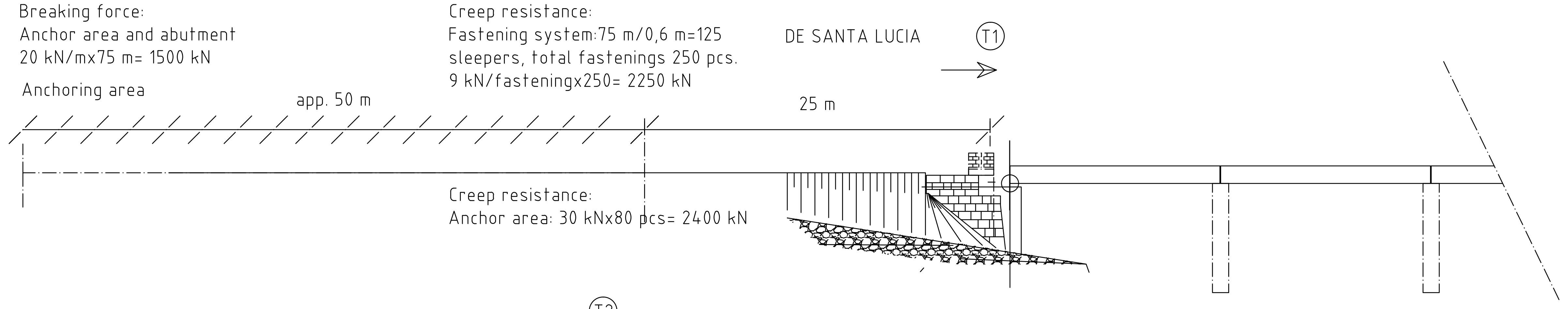


F = 1500 kN

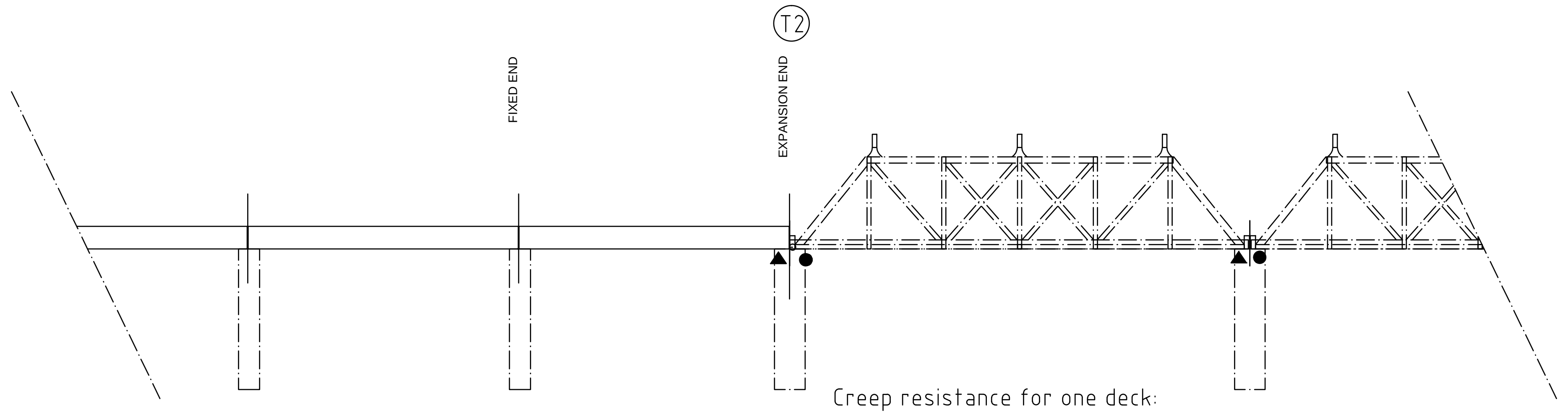
Breaking force:
Anchor area and abutment
20 kN/mx75 m= 1500 kN

F = 2250+2400 kN

Creep resistance:
Fastening system:75 m/0,6 m=125
sleepers, total fastenings 250 pcs.
9 kN/fasteningx250= 2250 kN



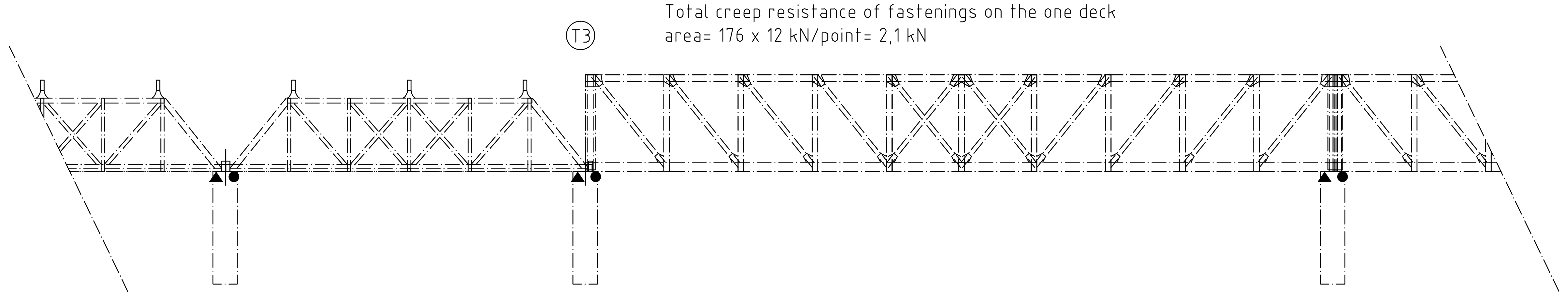
Creep resistance:
Anchor area: 30 kNx80 pcs= 2400 kN

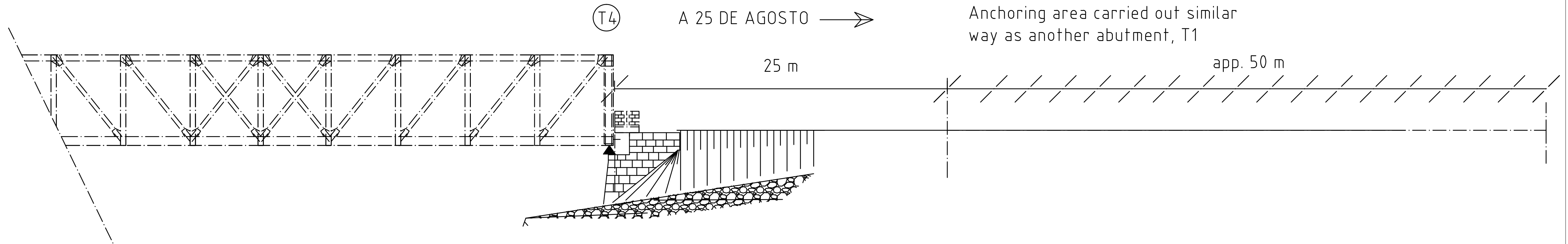


Rolling bearing ●

Fixed bearing ▲

Creep resistance for one deck:
Number of fastening points=53 m/0,6= 88 pcs x 2= 176 pcs
Total creep resistance of fastenings on the one deck
area= 176 x 12 kN/point= 2,1 kN





Anchoring area carried out similar
way as another abutment, T1

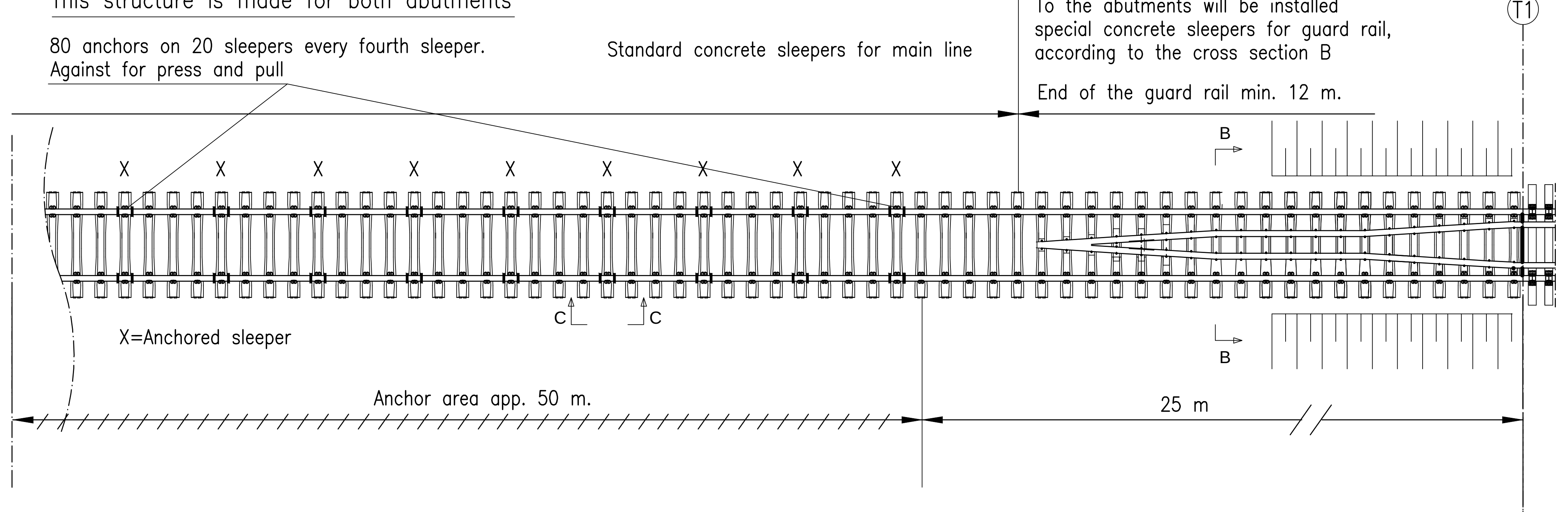
This structure is made for both abutments

80 anchors on 20 sleepers every fourth sleeper.
Against for press and pull

Standard concrete sleepers for main line

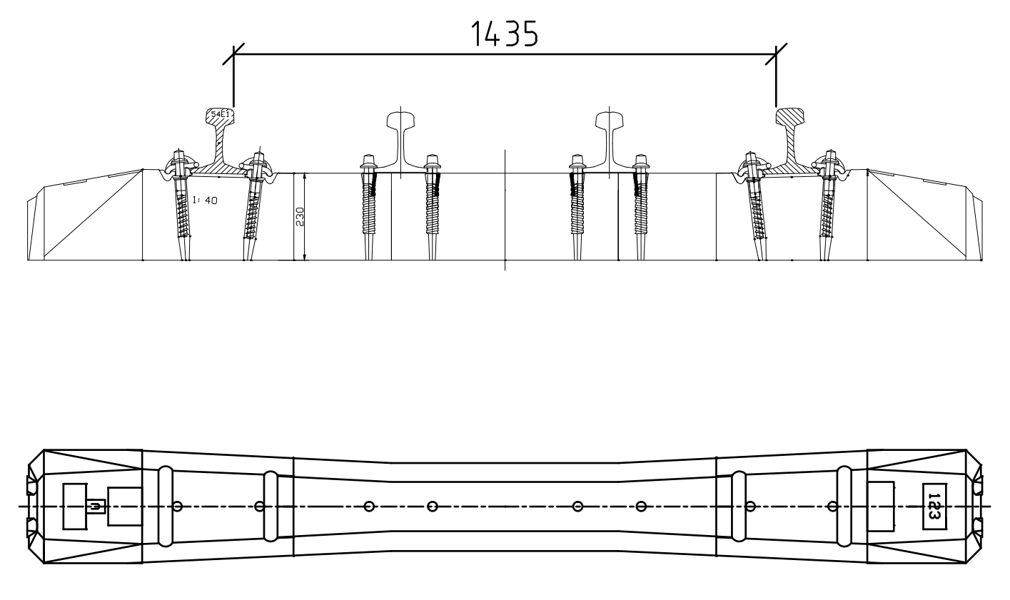
To the abutments will be installed
special concrete sleepers for guard rail,
according to the cross section B

End of the guard rail min. 12 m.



X=Anchored sleeper

B-B

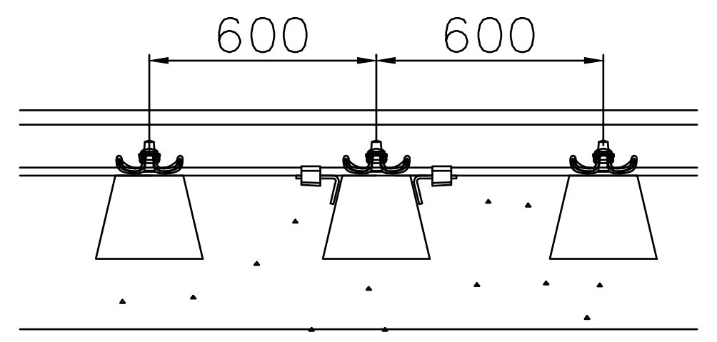


Concrete sleepers for guard rail

Remarks:
Tightening of the tension clamp:
The tension clamp is correctly fitted if the middle bend
has contact with the rail foot or an air gapup to 2mm exist.
Standard value for the necessary torque: approx. 180 to 200 Nm.
Tightening of the Helical spring:
The helical spring must have a total height of 39mm when tensioned.
Lateral adjustment:
Infinitely variable lateral adjustment up to ±4mm per fastening point.
Heiht adjustment:
Height adjustment up to +20mm by means of inserting height adjustment
plates with various thicknesses.

Stiffness of rail pad C>200 kN/m,
measured as secant stiffnes between 18–68
kN.
Tightening of the anchor bolt:
The distance between the turns of the
helical spring has to be approx. 1 mm,
when tightened. The necessary torque should
be in range of approx 40 Nm. Version for
controlled creep resistance in the range for
min 9 kN/fastening point.

C-C



Anchoring area, type "Mathee"

Anchors will be installed for longitudinal
press and pull forces

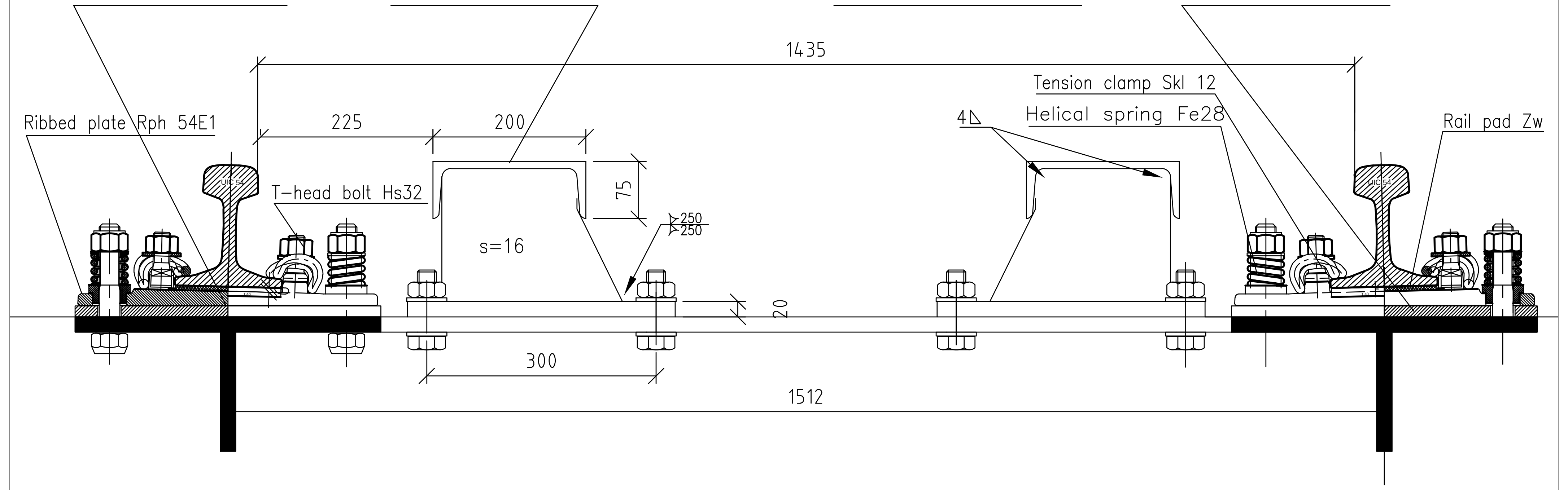
Cross section A

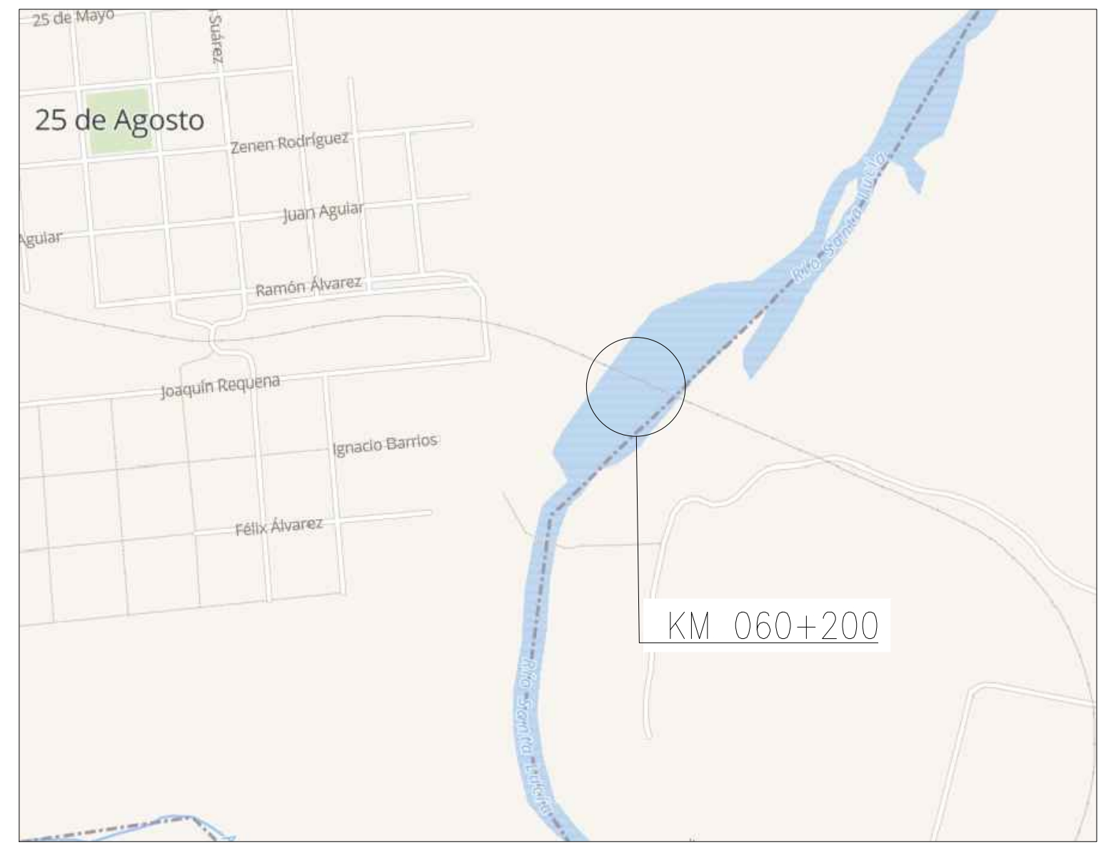
Assembly will be carried out
with casting elastic mass

Anti–derailment integrated
in the steel construction

Fastening system, direct on
the main beam of the bridge

Vertical deflection should be
approximately 1–2 mm,
between deck and base plate
in the finished structure





Version
23.10.2017

| Revision | Explanation | Date | Designer | Date | Acceptor |
|---|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Owner: MINISTERIO DE TRANSPORTE Y OBRAS PÚBLICAS | | | Project: Railway Project<br>Design phase: Pre-engineering, Phase 2 | |
| Engineering: VR TRACK | | | Content: *Rio Santa Lucia*<br>*Rail*<br>*Km+m 60+200* | |
| Drawer | *28.08.2017* | *Raimo Hämäläinen* | Loading | *LM71-25* |
| Designer | *28.08.2017* | *Raimo Hämäläinen* | Coordinate and elevation reference system | *WGS 84 UTM 21* |
| Supervisor | *23.10.2017* | *Reima Niklander* | Railway line | |
| Accept. | | | Archive / Type / Number / Rev. / Sheet | *RB* / *xxxx* / *-* / *1* |
| Cust. acc. | | | | |