



Group of Experts on Improving Safety at Level Crossing

Geneva, 12-13 May 2014



Current Situation



Number of total level crossings in Turkey : 3314

- Guard + barrier : 257
- Automatic barrier : 769
- Flasher + Bell : 36
- Free (with stop sign) : 2252



Responsible Institutions



Governorates	2303
Turkish Armed Forces	12
Municipalities	731
DG Turkish Highways (KGM)	180
DG State Hydraulic Works (DSİ)	10
Private Institutions	68
Other	10
Total level crossings	3314



Improvements Studies at Road-Railway Level Crossings



- Until the end of 2011, 555 uncontrolled level crossings has been converted to controlled crossings by Turkish State Railways (TCDD).
- Number of protected crossings has reached 1.054.
- 260 level crossings with auto flasher have been transformed to automatic barriers.
- To be more safe and comfortable infrastructure at level crossings, 1.101 total improvements on covering (rubber, asphalt, wood, paving stones, etc.) were made.



Improvements Studies at Road-Railway Level Crossings by KGM



- There are 180 rail-road crossings over state and provincial roads under the responsibility of KGM.
- The 22 items of these level-crossings are guard controlled, the 101 items are with rail circuit + automatic barrier, the 57 items are sign controlled without barrier.



Improvements Studies at Road-Railway Level Crossings by KGM



- From these level crossings;
 - 39 of these have been (being) converted to underpass or overpass.
 - 94 of these are planned to be converted as underpass or overpass.
 - And the other 47 level crossings have expropriation, topography and other problems. Therefore, they have to be used in its present form.



Accidents occurred at level crossings



According to data from DG of Security (2012):

- Totally 93 mortal and injured accidents have occurred on the roads under the responsibility of KGM.



Accidents occurred at level crossings



Level Crossing	State road	Provincial road	Access road	Total
Controlled railroad crossings	28	8	6	42
Uncontrolled railroad crossings	31	12	8	51
Total	59	20	14	93

Level Crossing	Dead	Injured	Total
Controlled railroad crossings	4	68	72
Uncontrolled railroad crossings	2	94	96
Total	6	162	168



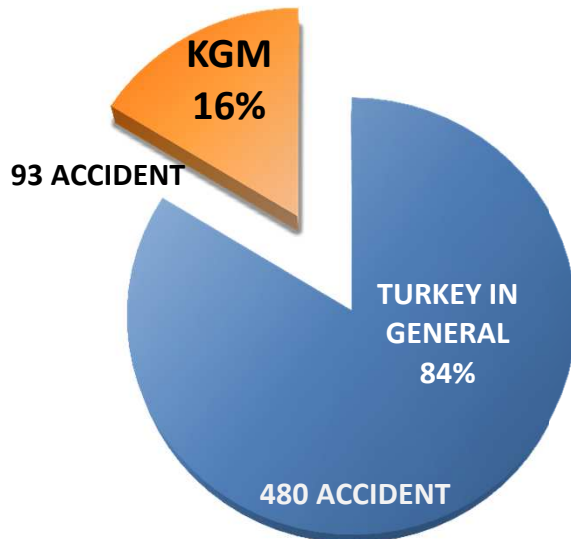
Mortal And Injured Accidents At Rail-Road Level Crossings



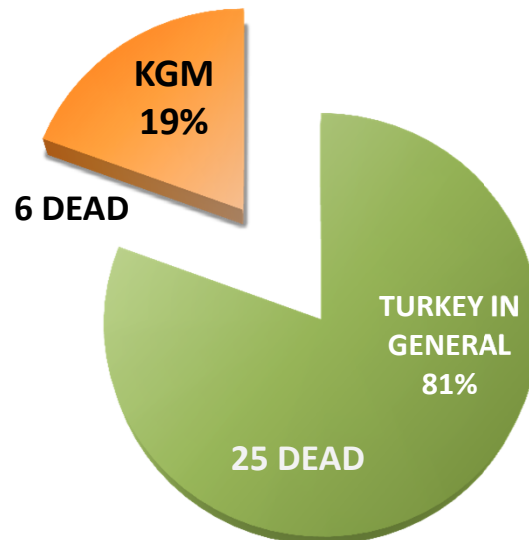
Total accidents on the roads under the responsibility of KGM is 1.7% of general.

YEAR 2012: RAIL ROAD LEVEL-CROSSINGS

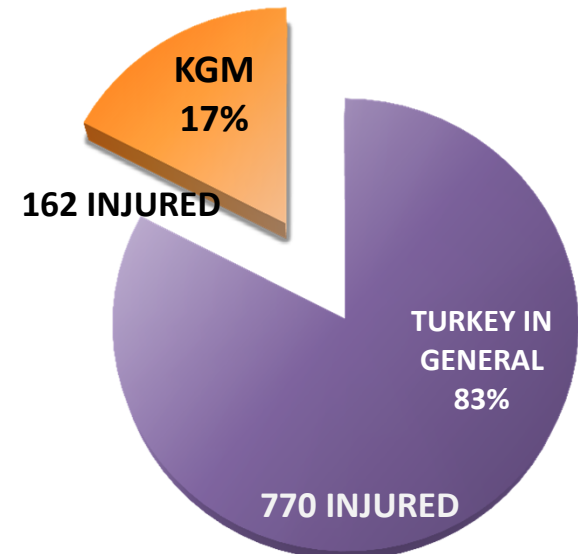
TOTAL ACCIDENT RATES



MORTAL ACCIDENT RATES



INJURED ACCIDENT RATES





Reasons of the accidents at rail-road level crossings



- Train-vehicle crashes occurs due to impatient driver and nonstop passing request on uncontrolled level crossings.
- Train-vehicle crashes occurs due to driver request to pass between the arms of closed barriers on uncontrolled level crossings.
- Train-vehicle crashes occurs due to automatical barrier faults and staying late to intervene.



Current Law and Legislation



Law on Turkish Railway Transport Liberalization

- ☐ Law number : 6461
- ☐ Adoption date of law : 24.04.2013,
- ☐ Number of official journal:28634,
- ☐ Date of official journal: 1 May 2013

- **Article 9: Rail and road intersections**

- Clause 1: At railroad level crossing, railway is considered as main road and rail vehicles have the advantages of transition.
- Clause 2: Institutions or organizations responsible for new road have to build underpass or overpass. In addition, same Institutions or organizations have to take other safety measures.



Current Law and Legislation



Legislation about the measures to be taken at level crossings and the implementation principles ;

- This regulation prepared on the basis of the Law numbered 2918, Road Traffic Safety Law and Turkish Railway Transport Liberalisation Law was published in the 03.07.2013 day and 28696 numbered official journal.
- In general, how to improve existing level crossing, where the level crossing could not be built, the distance between the level crossings and signing standards have been identified in this regulation.



Improvement works to be made in accordance with regulation provisions



- 1) 150 m. length part of approach roads are converted to asphalt or paving stone at all level crossings.
- 2) 50 m.length part of the road is flattened to 0% grade at the entrance and the exit of rail-road level crossings.



Improvement works to be made in accordance with regulation provisions



- 3) Rail-road level crossings are regulated by narrowing the pavement width.
- 4) 150m. Length median with yellow colour stone 15cm. height or New Jersey A type concrete guardrails are designed at both sides of the approach roads of rail-road level crossings.



Improvement works to be made in accordance with regulation provisions



- 5) Approaching railroad level crossing traffic signs are placed at every 100m. from the 300m length to intersection.

«Attention Railroad» is written on a rectangular traffic sign under the «controlled and uncontrolled» signs. DIAMOND type material at lightened and high performance reflective material at unlightened areas will be placed above these traffic signs.



Improvement works to be made in accordance with regulation provisions



- 6) 10 cm. height curbstones, CTP roadside delineators will be placed at both sides of roadway along 150 m. length before intersection with rightside red reflectors and leftside white reflectors at a specific distance.
- 7) At the approaches of rail-road level crossings, 80m. length off-set hatching will be made from the physical nose of median..



Improvement works to be made in accordance with regulation provisions



- 8) At the bituminous hot-mixture approaches of rail-road level crossings, horizontal signing and deceleration warning lines will be applied to alert drivers physically.
- 9) At rail-road level crossings, built-in camera following the penalty to start the implementation of controls will be carried out.



Improvement works to be made in accordance with regulation provisions



- 10) New projects prepared due to standards mentioned above, will be sent to KGM.
- 11) After traffic safety controls, these projects to be implemented in whole country will be sent to the Provincial Governors.



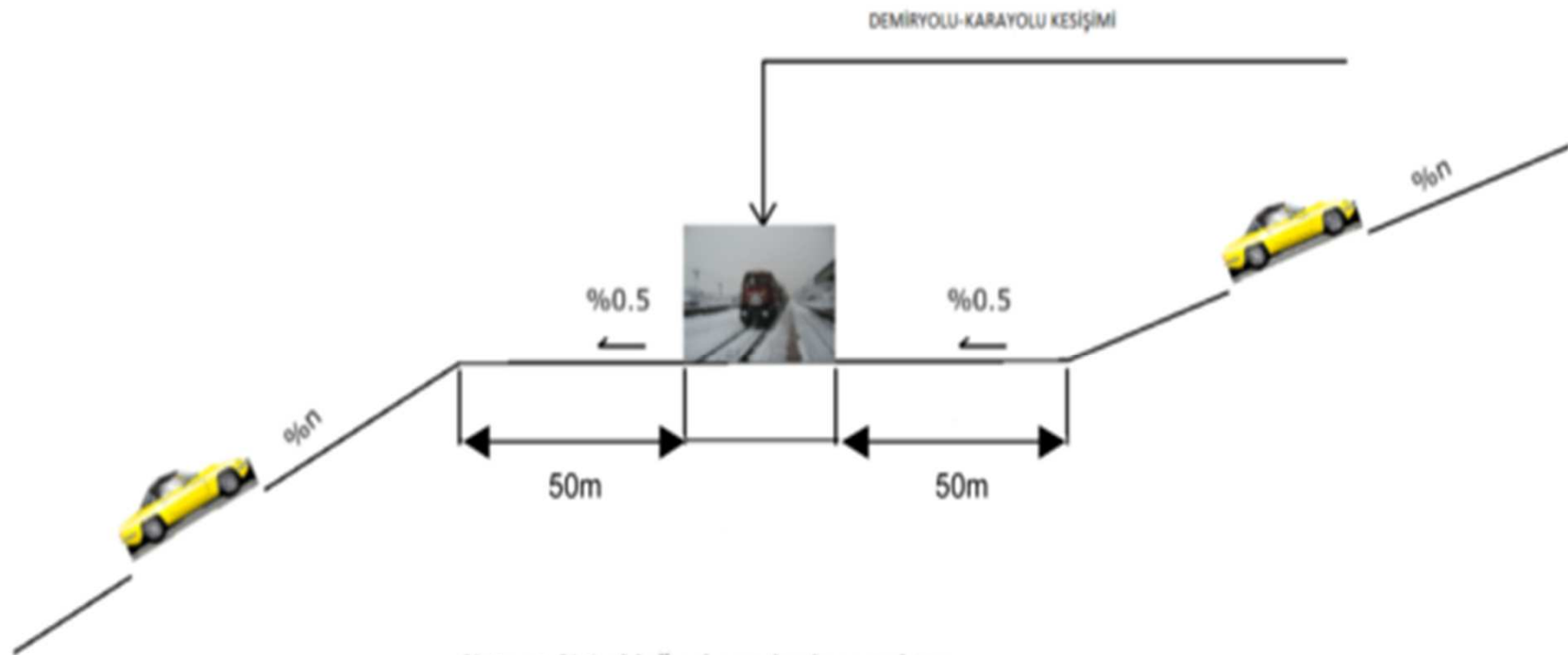
IMPROVEMENT WORKS TO BE MADE IN ACCORDANCE WITH REGULATION PROVISIONS



Improvement works to be made in accordance with regulation provisions



- Insufficient stopping sight distance at the rail-road level crossings will be increased as below (it is applied in case of $n > 4\%$):



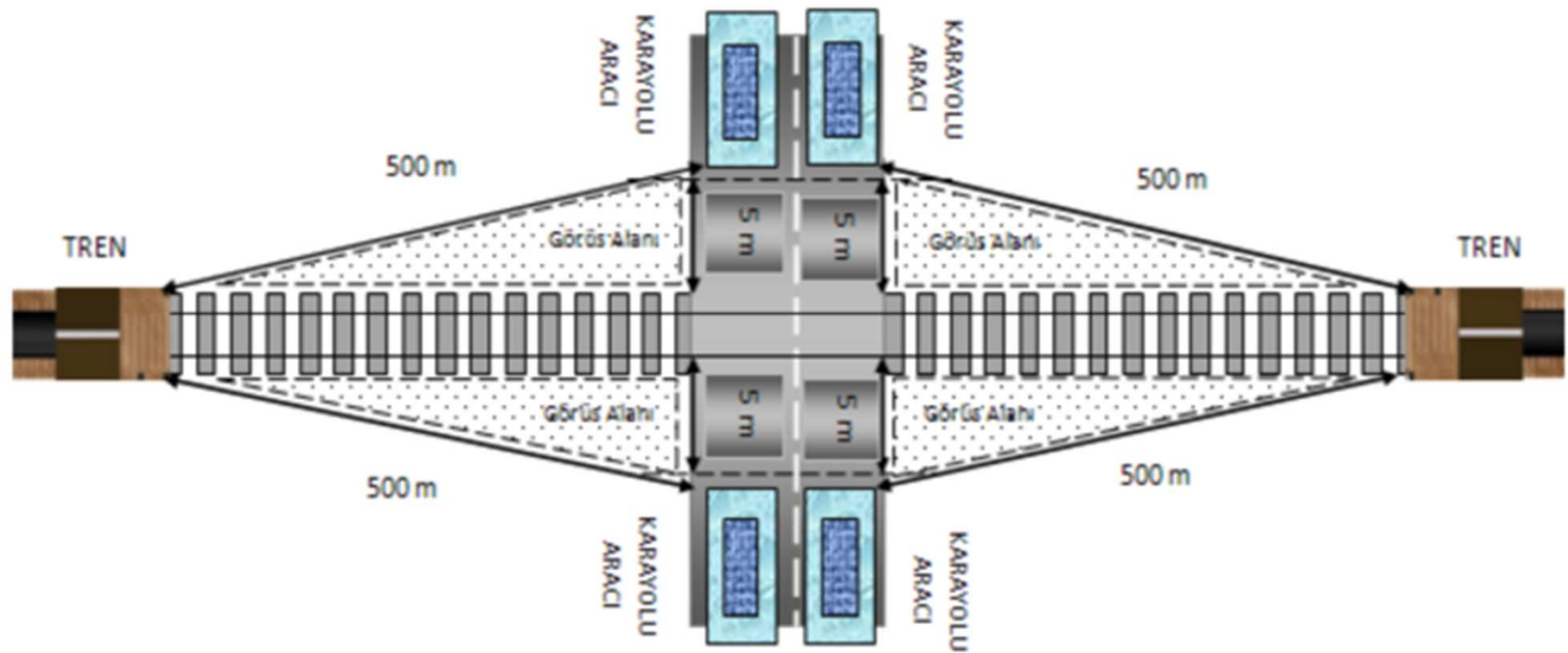
Not: $n > 4\%$ olduğu durumlarda uygulanır



Improvement works to be made in accordance with regulation provisions



- Insufficient clear sight triangle area at the rail-road level crossings will be increased as below :

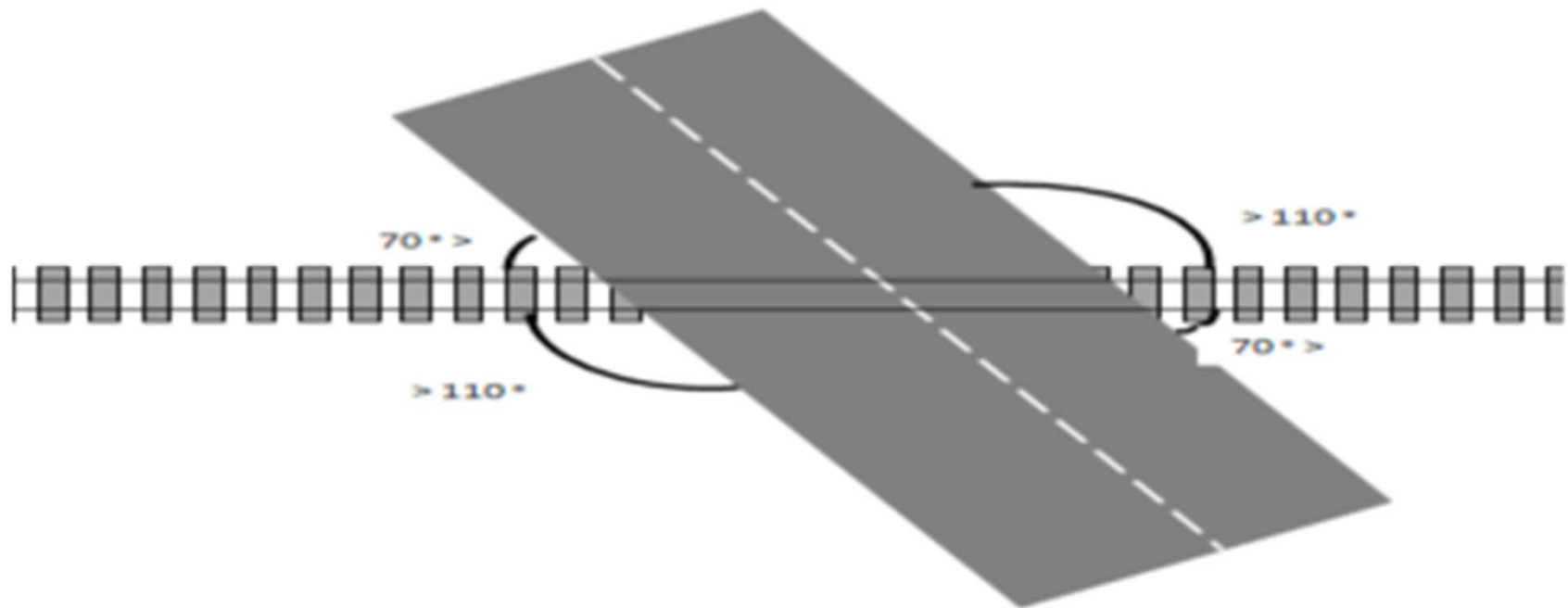




Improvement works to be made in accordance with regulation provisions



- Rail- road intersection angle will be increased as below:

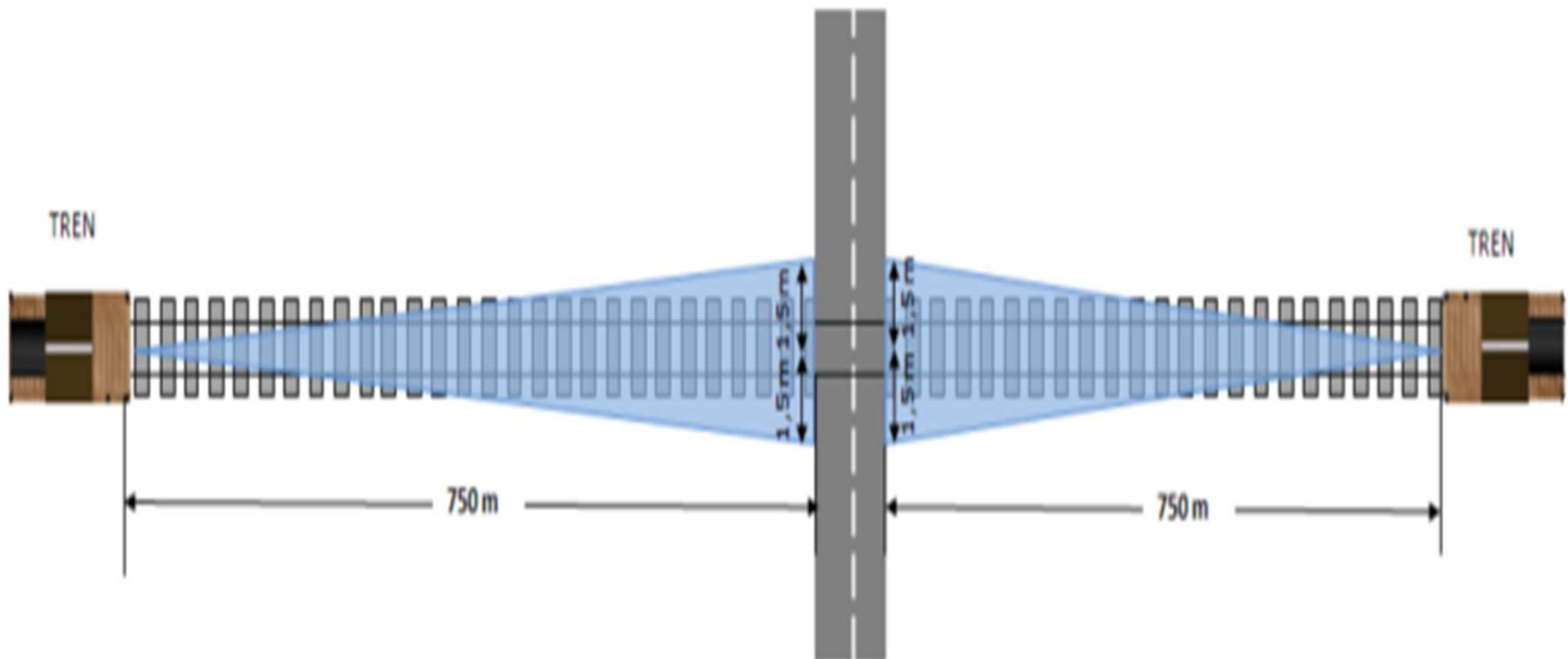




Improvement works to be made in accordance with regulation provisions



- Inadequate sight distance of railway vehicles will be solved as below:





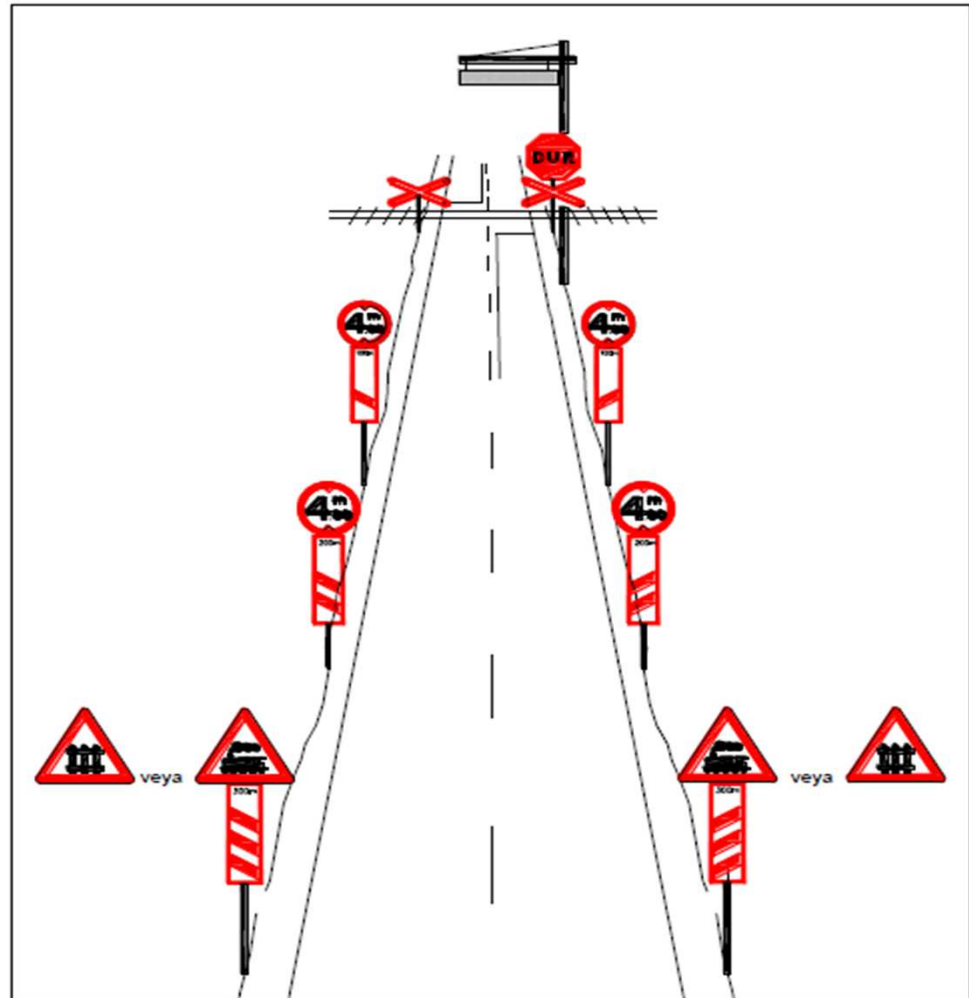
**Signings to be made in
accordance with regulation
provisions**

Signing in Case of Situation 1



**TRAVEL MOMENT ≤ 15.000 and
 $V_{\text{train}} \leq 120$ km/hour**

TRAVEL MOMENT =
AADT_{train} * AADT_{vehicle}



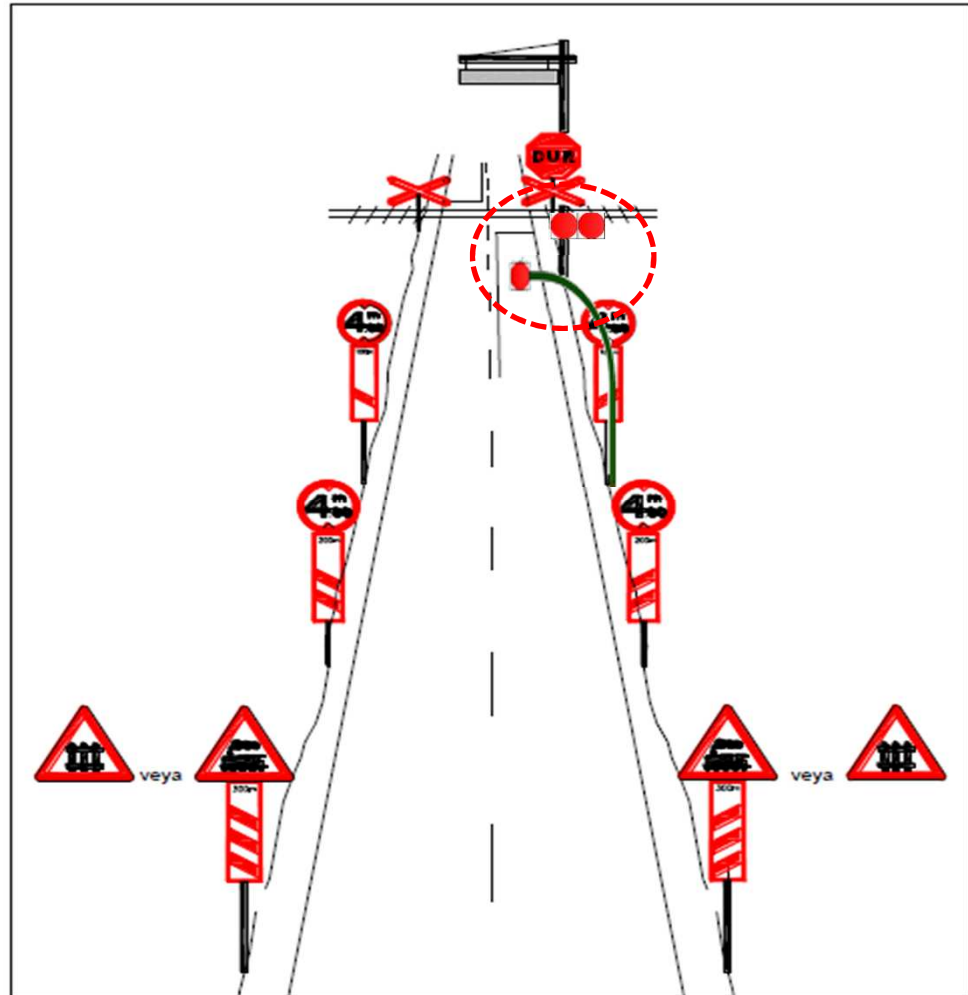


Signing in Case of Situation 2



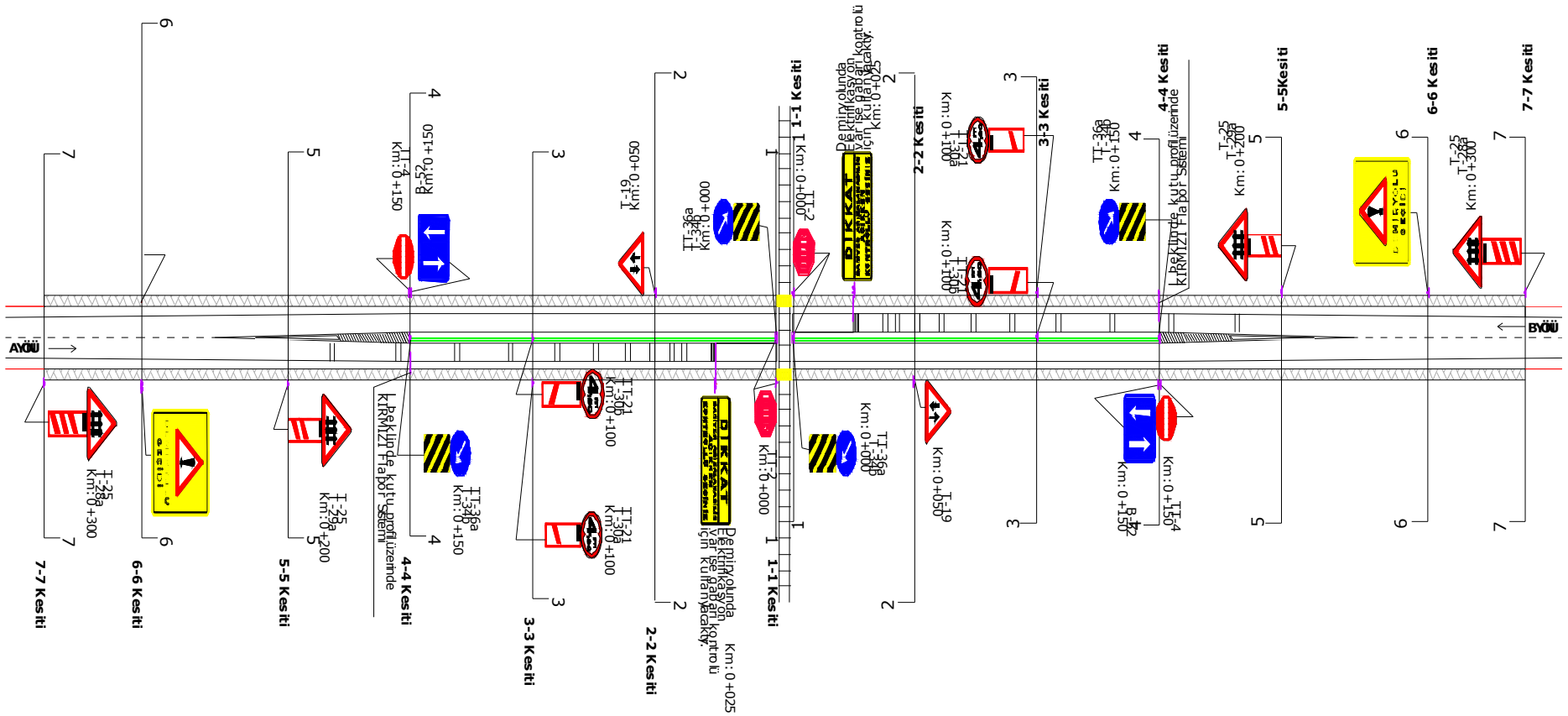
$15.000 < \text{TRAVEL MOMENT} \leq 30.000$

$V_{\text{train}} \leq 120\text{km/hour}$





Signings to be made in accordance with regulation provisions (Situation 3)

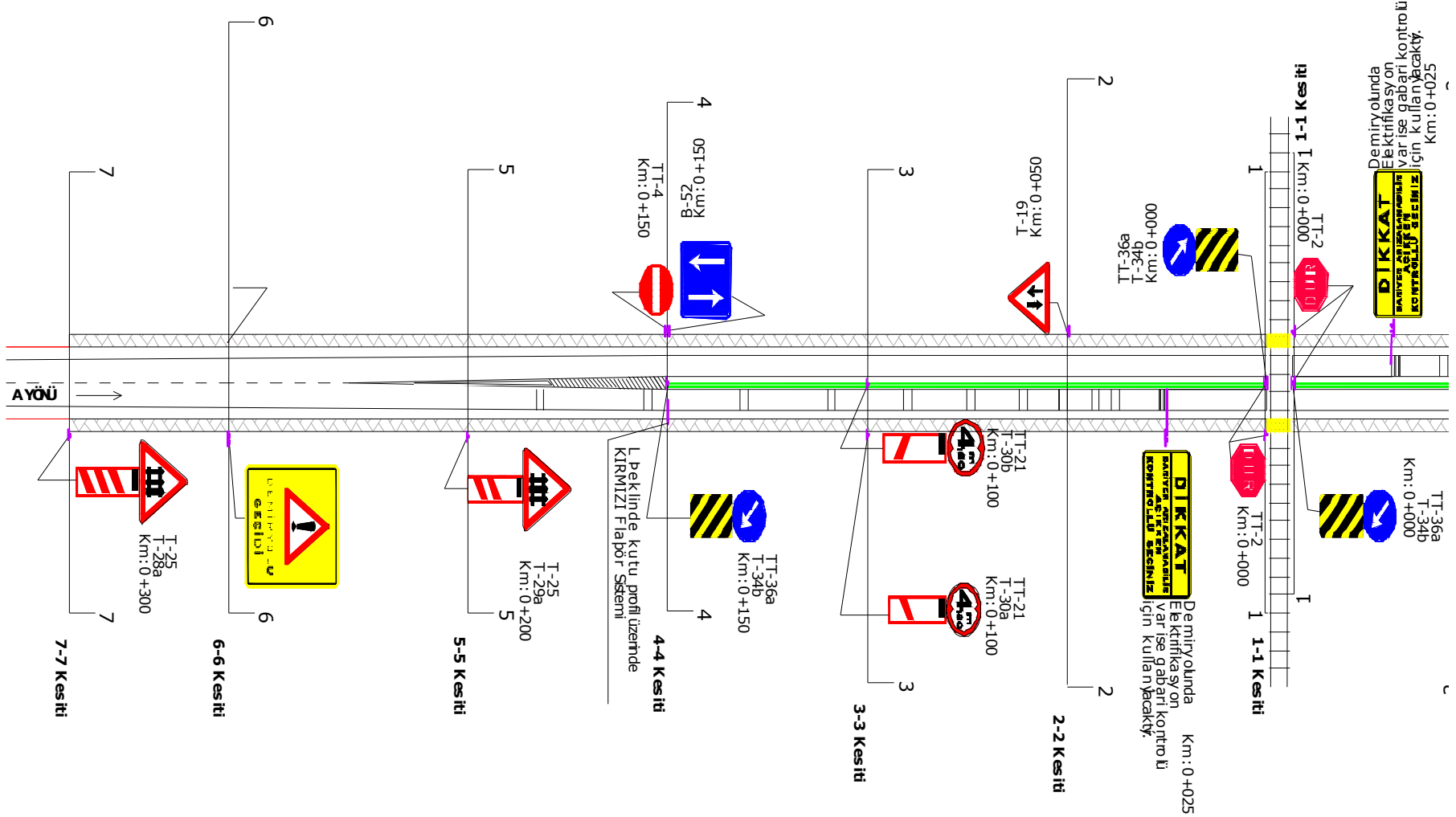


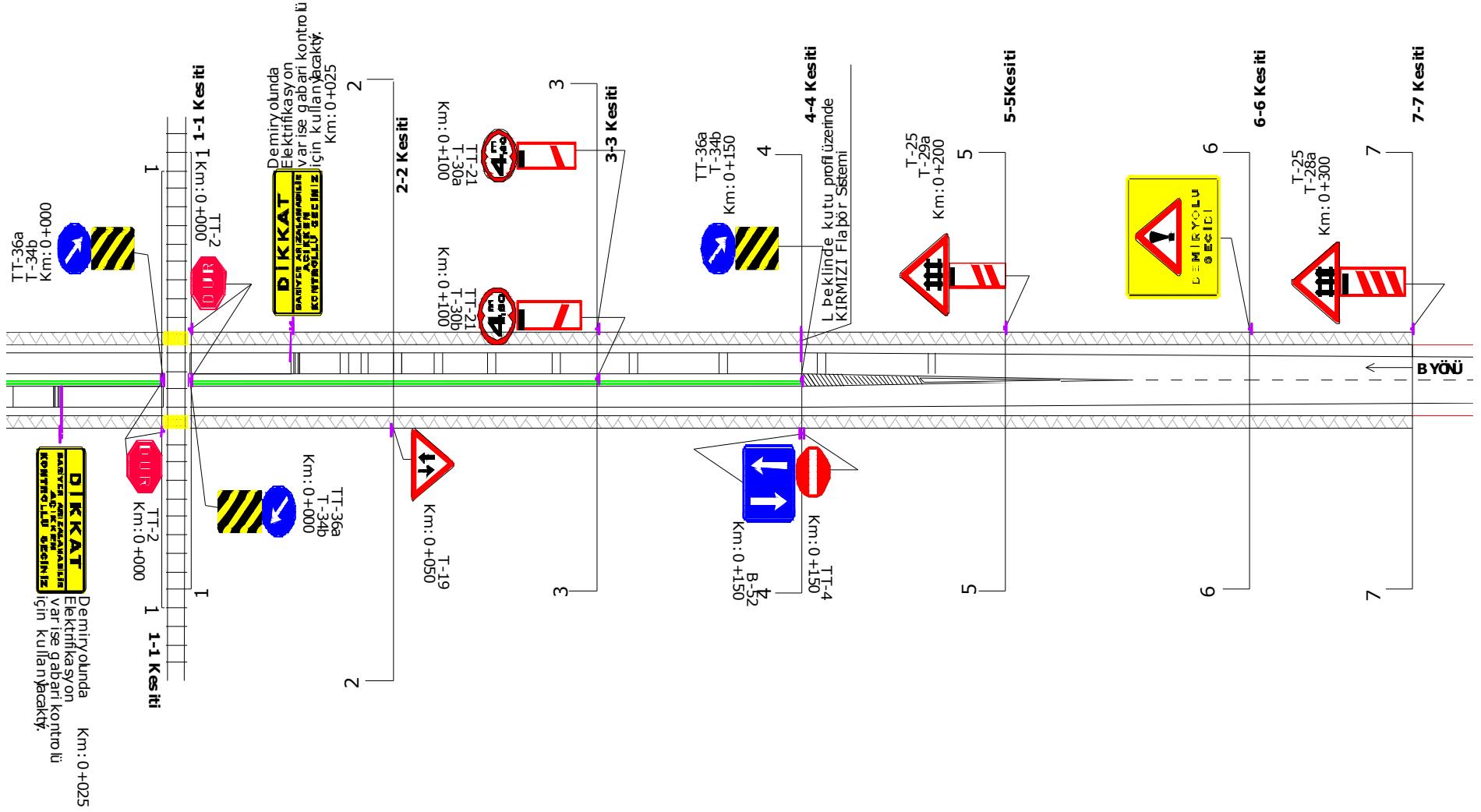
15.000 < TRAVEL MOMENT ≤ 30.000

$V_{train} \leq 160 \text{ km/hour}$



Signings to be made in accordance with regulation provisions





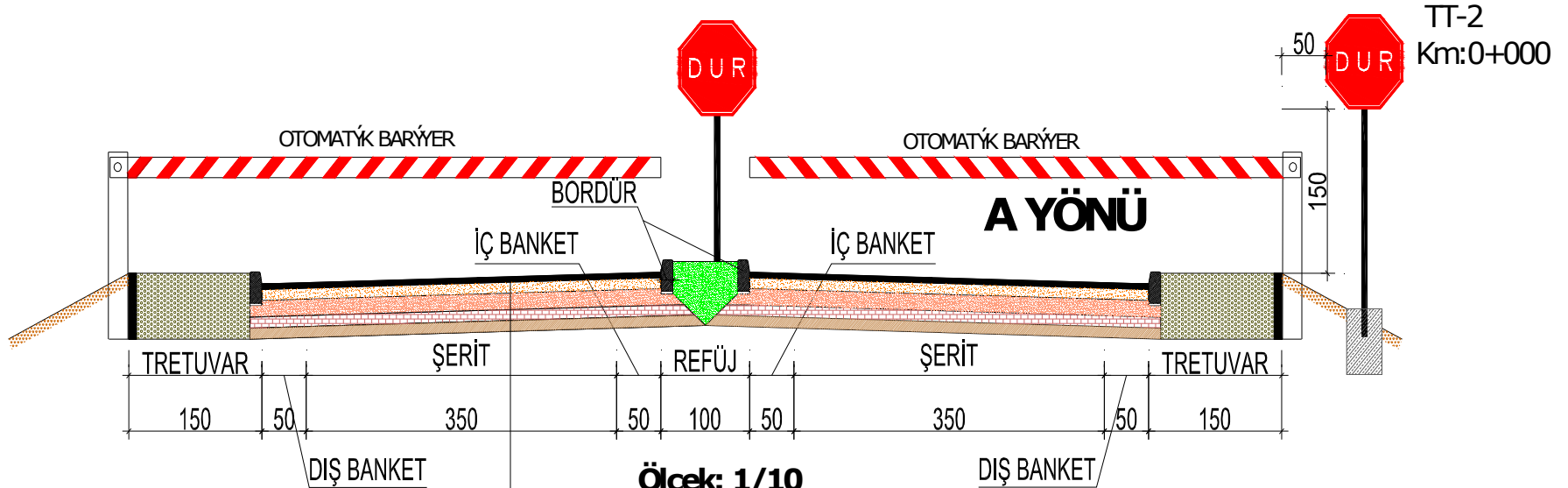


Signings to be made in accordance with regulation provisions



A YÖNÜ

1-1 Kesiti



B'YNDER

B'YÜMLÜ TEMEL

TEMEL

ALTTEMEL

SEÇME MALZEME (GEREKTİĞİNDE)

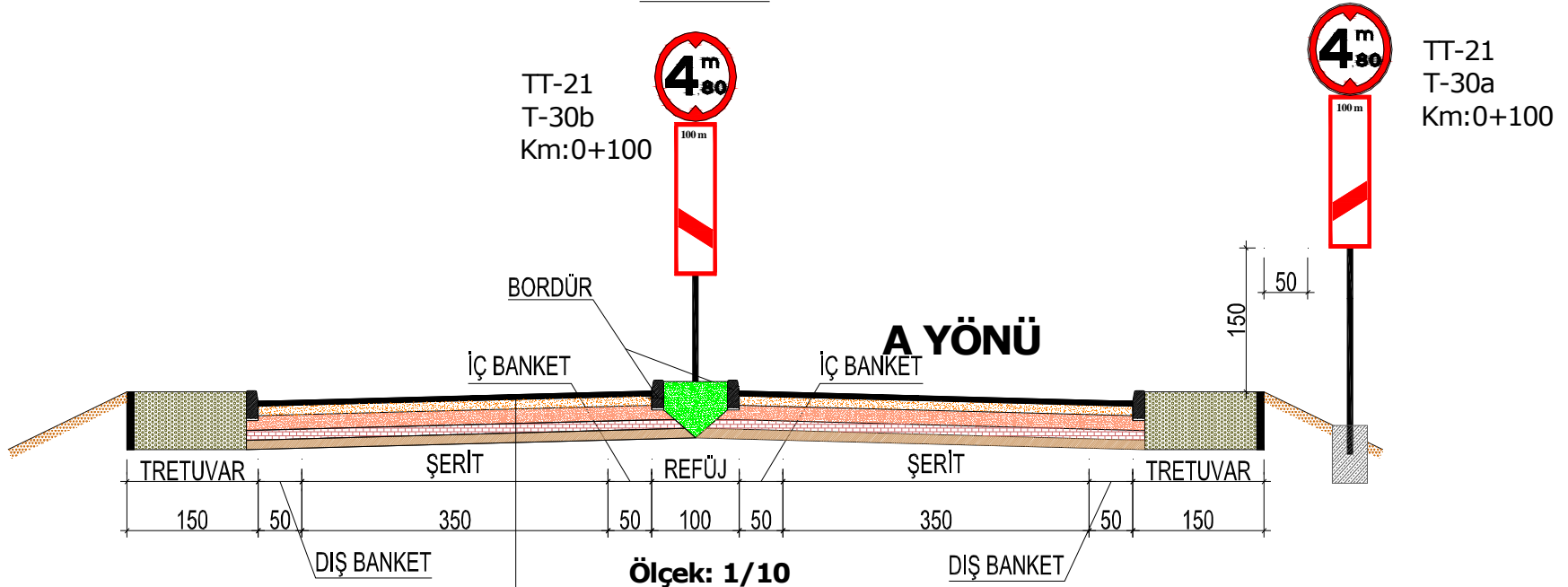


Signings to be made in accordance with regulation provisions



A YÖNÜ

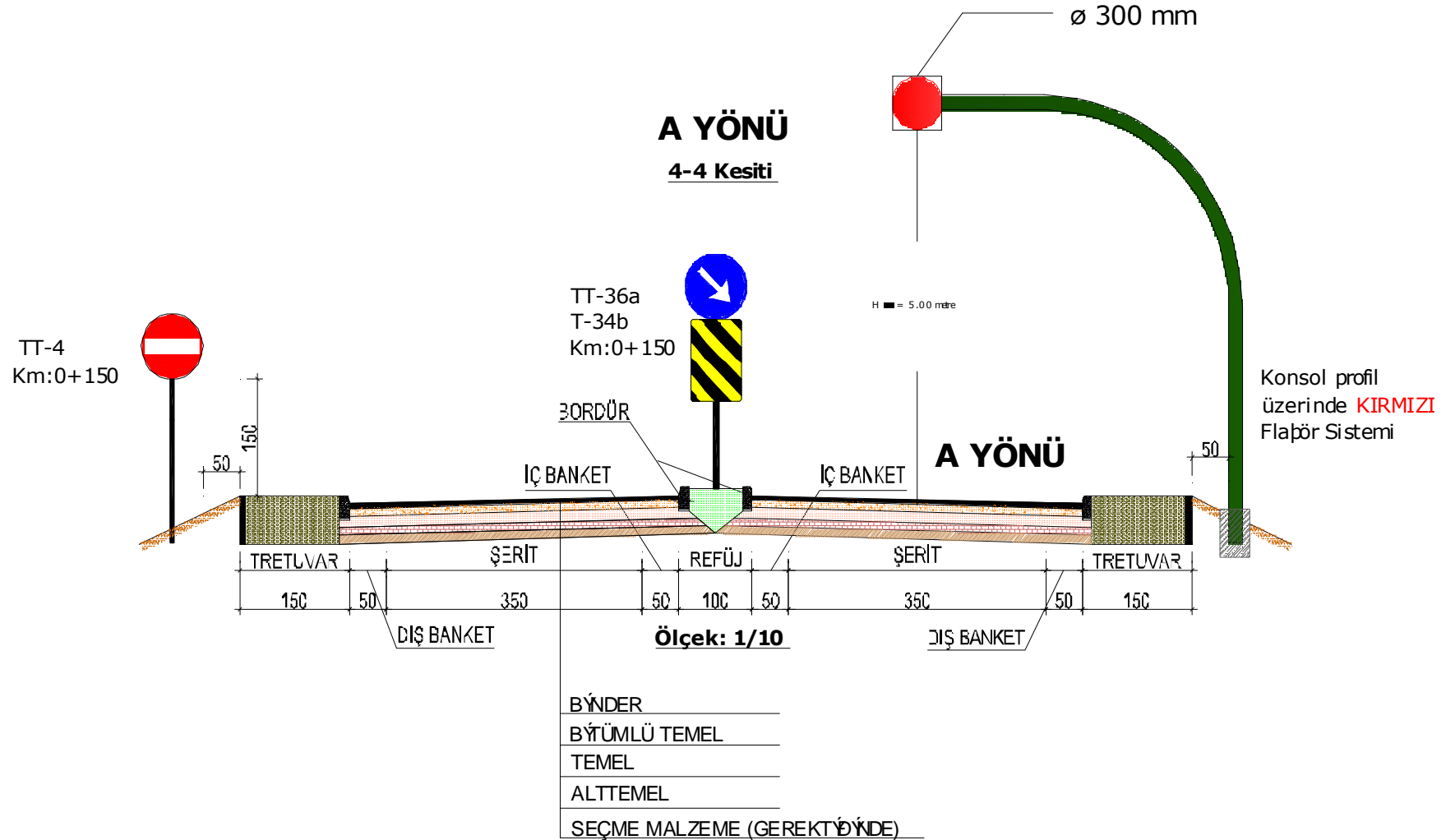
3-3 Kesiti



BİNDER
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SEÇME MALZEME (GEREKTİĞİNDE)

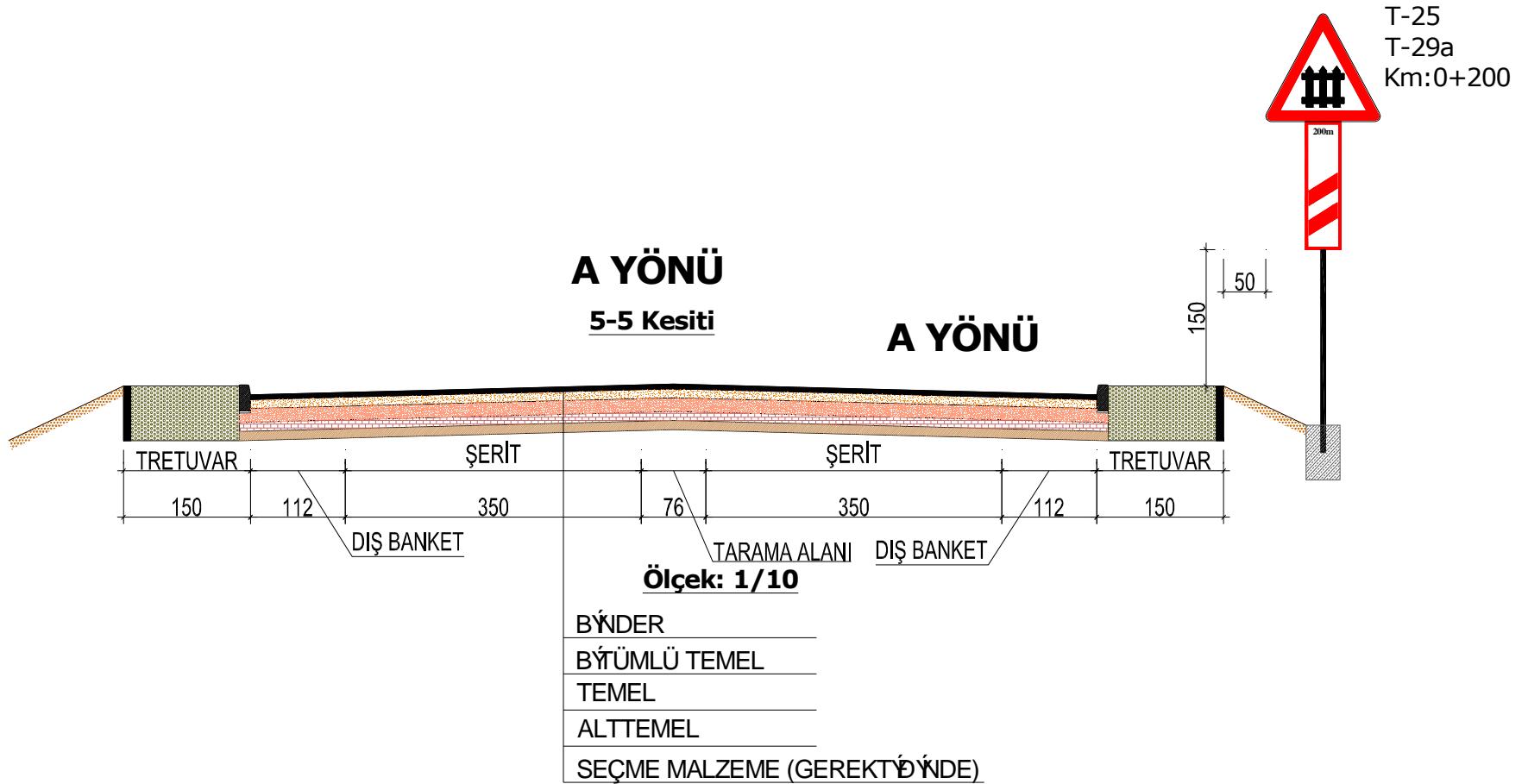


Signings to be made in accordance with regulation provisions



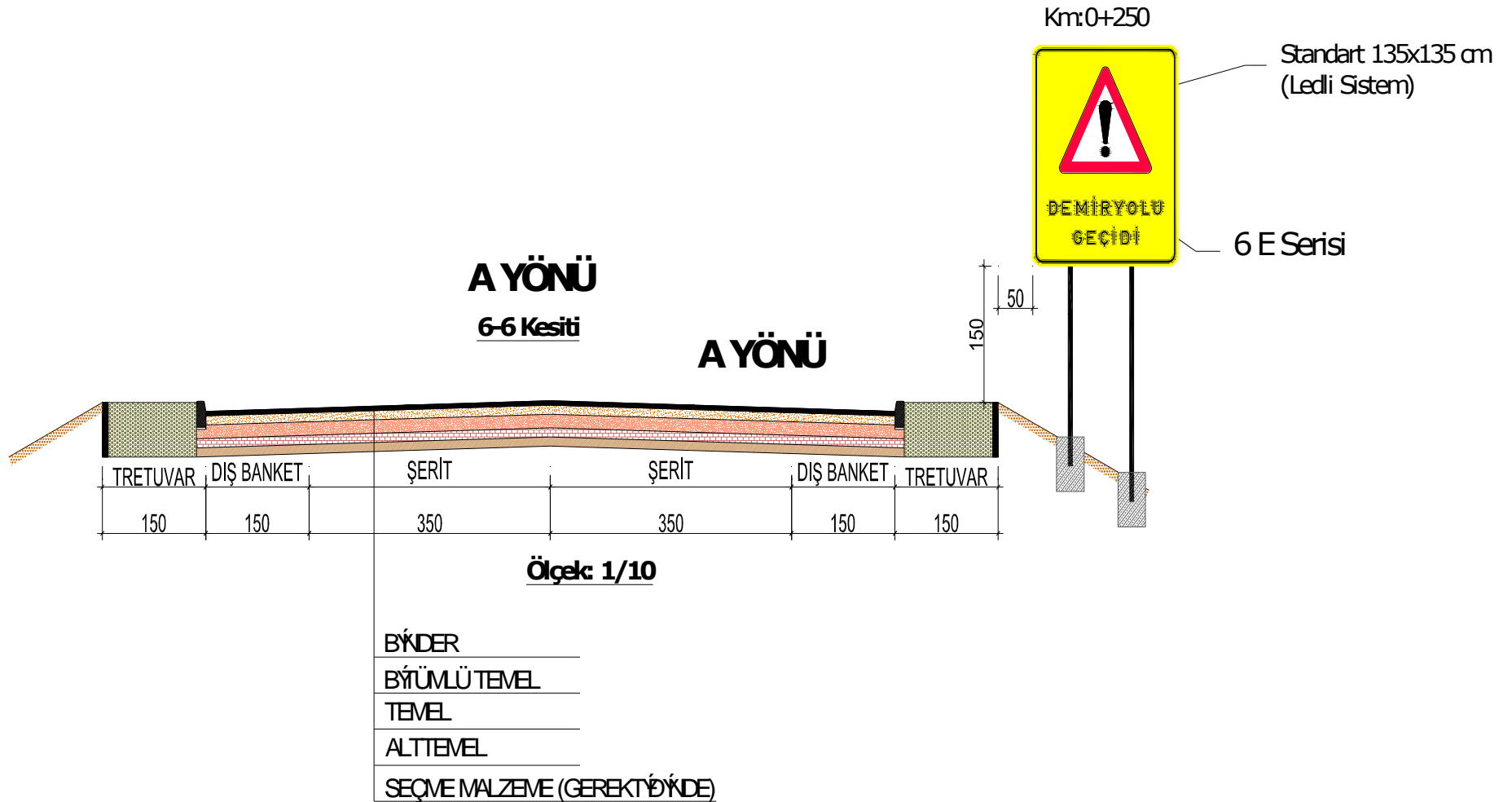


Signings to be made in accordance with regulation provisions



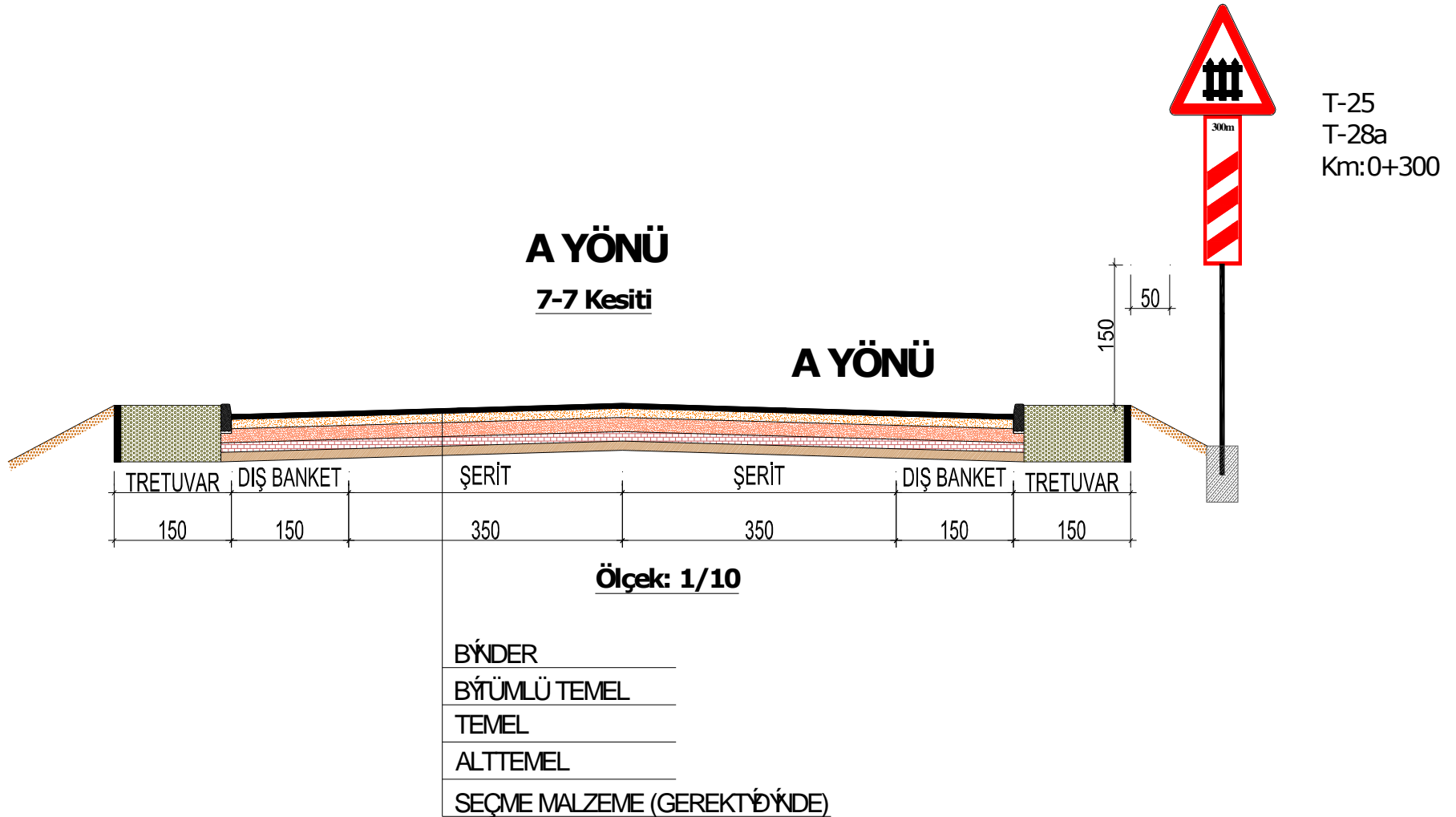


Signings to be made in accordance with regulation provisions





Signings to be made in accordance with regulation provisions



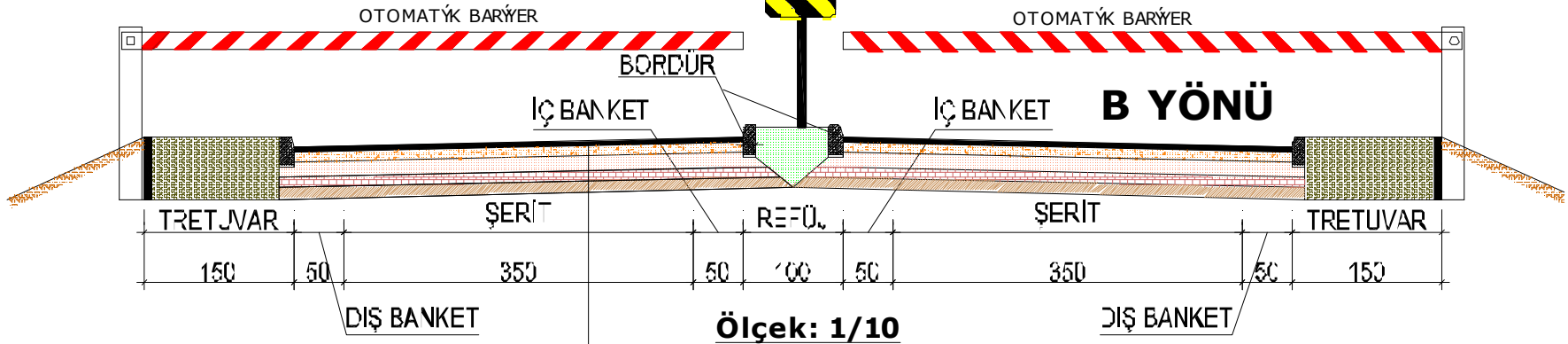


Signings to be made in accordance with regulation provisions

B YÖNÜ

1-1 Kesiti

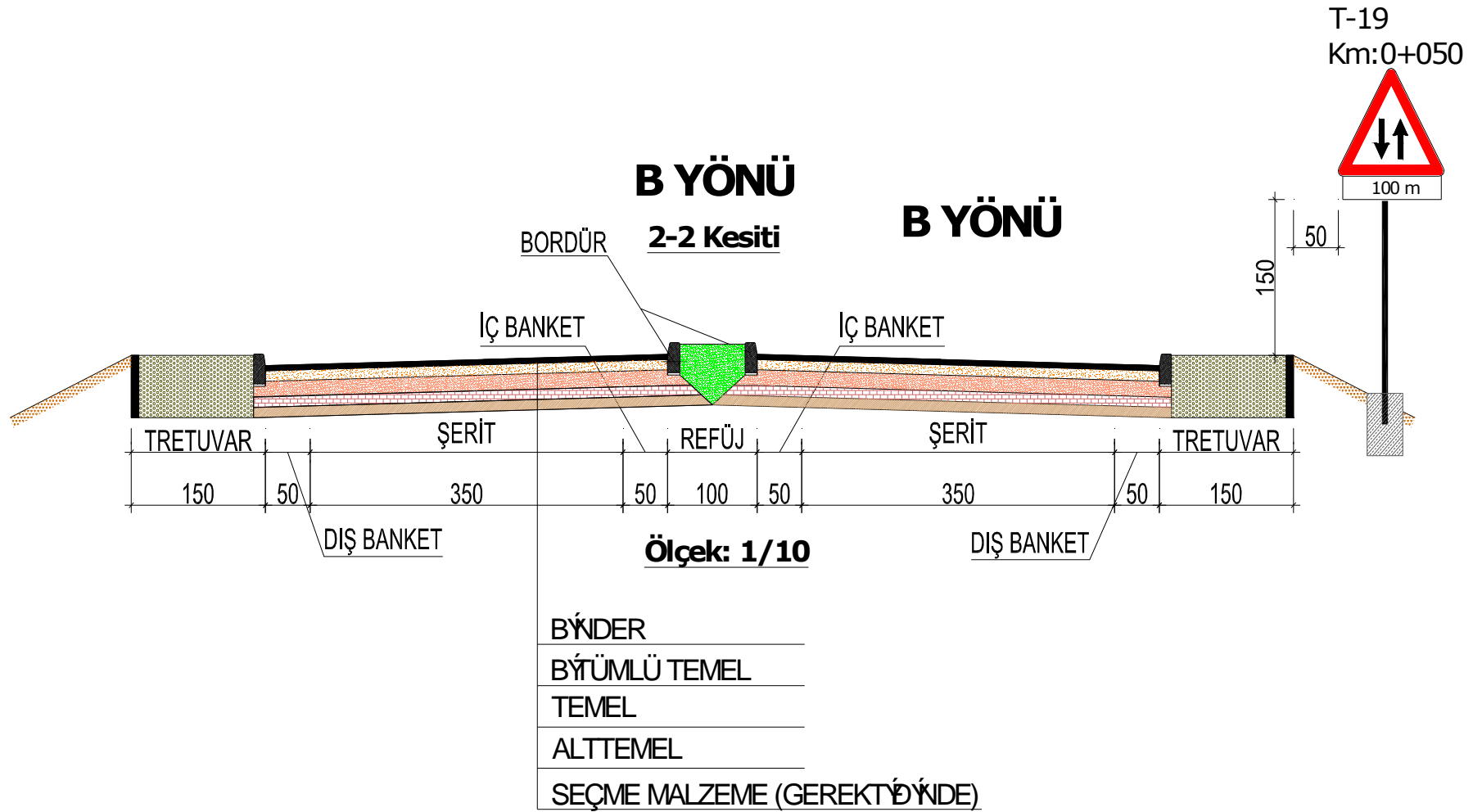
TT-36a
T-34b
Km:0+000



BÝNDER
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TEMEL
ALTTEMEL
SEÇME MALZEME (GEREKÝÝİNDE)



Signings to be made in accordance with regulation provisions

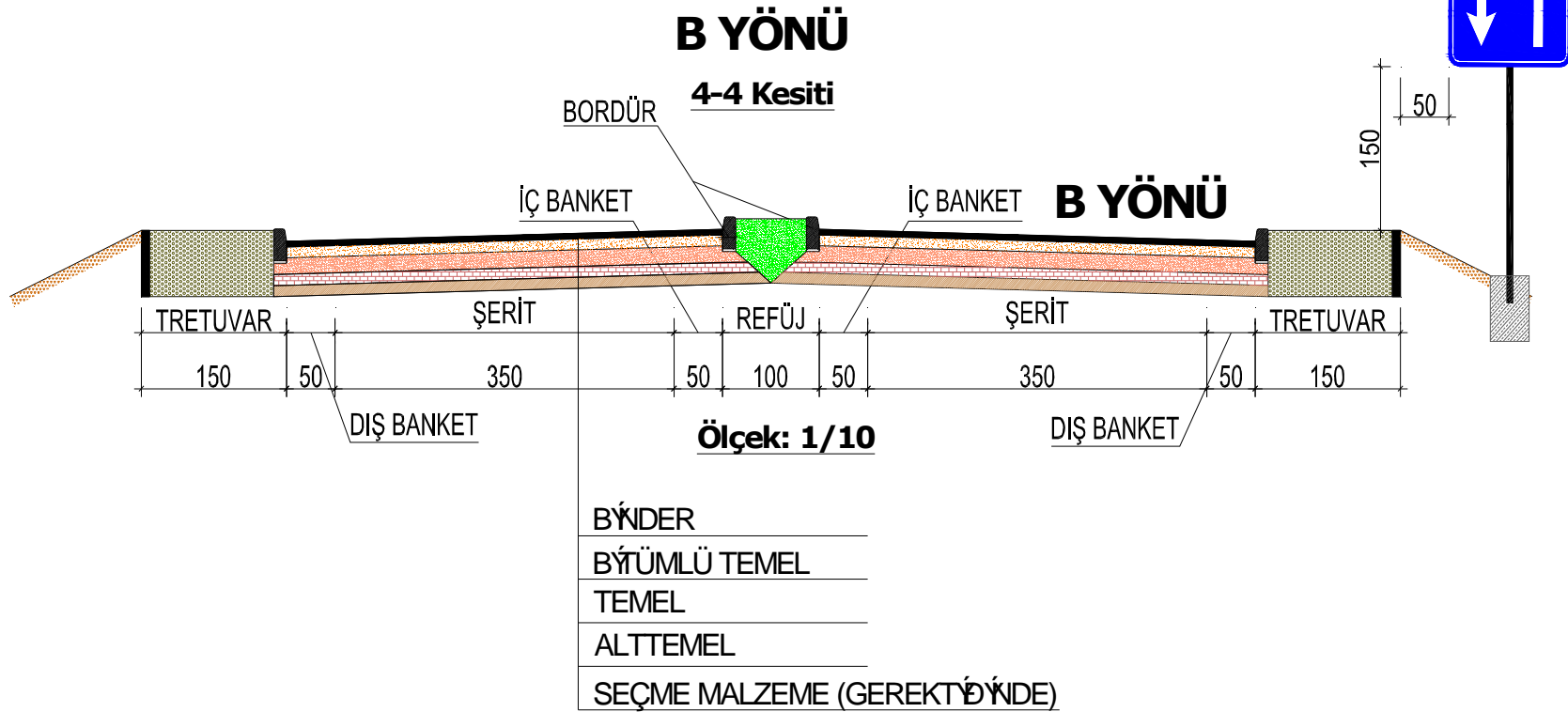




Signings to be made in accordance with regulation provisions



B-52
Km:0+150





The process of improvement works to be made in accordance with regulation provisions

- Prepared level crossing projects will be send to related institutions/organizations and provincial governors to be implement by Turkish State Railways(TCDD) after taking the approval from General Directorate of Turkish Highways (KGM).
- Level crossings will be improved within 3 years.

- Rail-road level crossing simulation for situation 3 (only 2 minutes)



**We would like to be volunteer country
in which a pilot project will be implemented.**



Thank you for your attention

For detailed information:

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