

## About the “Prof. Dimitrie Atanasiu” Roads Testing Station in Iassy

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### 1. THE FIRST ACCELERATED TESTING STATION FROM IAȘI

In 1957, at the Faculty of Civil Engineering was given into use the first road testing station in Romania. The Research Collective which has realized that station was formed by professors: D. Atanasiu, N. Preda, A. Șesan, Vârlan R ș.a.

The basic ideas of this project were:

- a. The image of a complex system were should be executed different types of complex road systems, at a scale similar to the real one considering the assurance of conditions as similar as possible with the real ones;
- b. The vehicles traffic action simulation in real limits considering the charge on wheel, the specific pressure on the contact area, the traffic intensity etc.;
- c. Reproduction in experiment of the meteorological factors variation, hydrological, for the variable level of ground water etc.;
- d. The assurance of the right information following the testing by quantification of all the factors which interfere in phenomena developed by experiments. The imagined testing system was composed of two main subsystems: the circular tank from reinforced concrete and rolling installation from metal.

The circular tank, fig.1, had the exterior diameter of 12.4 m, and the interior one of 7.00 m and a variable height between 1.45 m and 1.75 m. At the bottom of the tank was realized a filter bed from quarry stone. The variable hydrological conditions could be realized by ditches in the inferior part of the tank. There was also projected and realized, an installation for artificial rain.

The rolling installation was formed by a girder with metallic truss members, situated on two motor wheals at the girder extremities. The total length of the girder was 10.00 m, and the total weight of 43 KN. The rolling installation realized a rotation movement around a central ax and a lateral translation movement. This way, the wheals

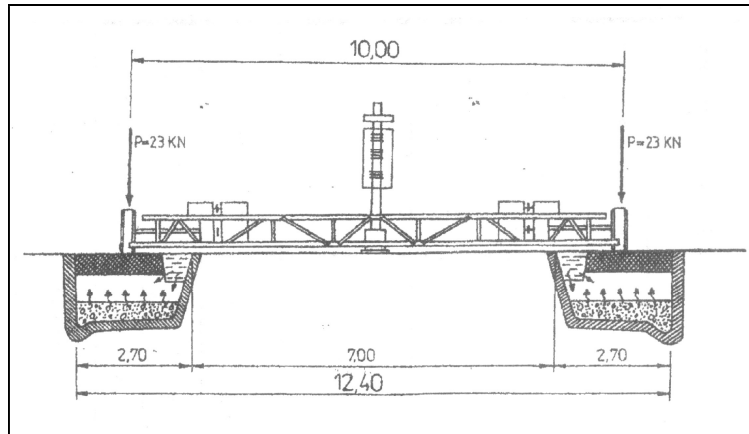


Fig. 1. Testing system – first generation, 1957

were covering, by the circular movement, a bandwidth of 69 cm. The maximal displacement speed was of 20.3 Km/h.

This testing installation was in exploitation for 25 years.

## 2. ACCELERATED TESTING STATION, SECOND GENERATION

In 1982 was given into exploitation the second accelerated testing station, in a new construction, photo 1., a bay with the opening of 24.00 m, containing the laboratories annexed to the station.



Photo 1. „Prof. Dimitrie Atanasiu” Accelerate Testing station, entrance in the testing bay

The testing system was formed of two main subsystems: the tank for creation of road complexes and for the imposed hydrological conditions and the rolling installation by which there are created the accelerate testing at traffic action.

The annular tank from reinforced concrete has the exterior diameter of 18.00 m, and the interior one of 12.00 m. In the tank can be realized a testing track with a width of 3.00 m and a thickness of 1.8 m, fig.2.

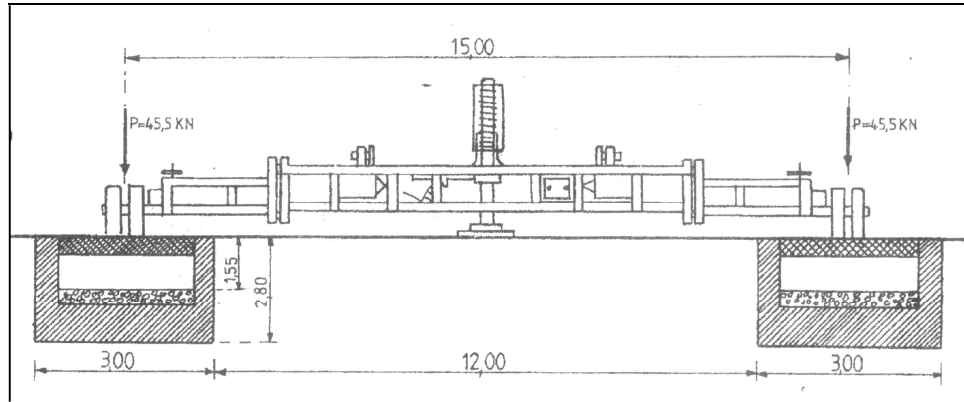


Fig. 2. Testing system – second generation, 1982

The rolling system is formed of a metallic girder with two double wheels installed at both ends. The girder length, measured in the double wheel axes is 15.00 m and the burden transmitted for each group of wheels is 45.5 kN, equal to the burden transmitted by the etalon vehicle A13. The rolling system can realize translation movements between limits  $\pm 0.5$  m.

With the second generation installation, into exploitation, for 14 years have been realized rigid and no rigid road systems, by creation a number of 1.8 millions of crossings of the etalon vehicle wheel A13.

## 2. ACCELERATED TESTING STATION, THIRD GENERATION

In 1997 was given into exploitation the third type of the accelerated testing station from Iassy.

The new testing system uses the tank in which there is realized the road complex for the tests, from the previous generation, fig.3, but uses a new rolling system.

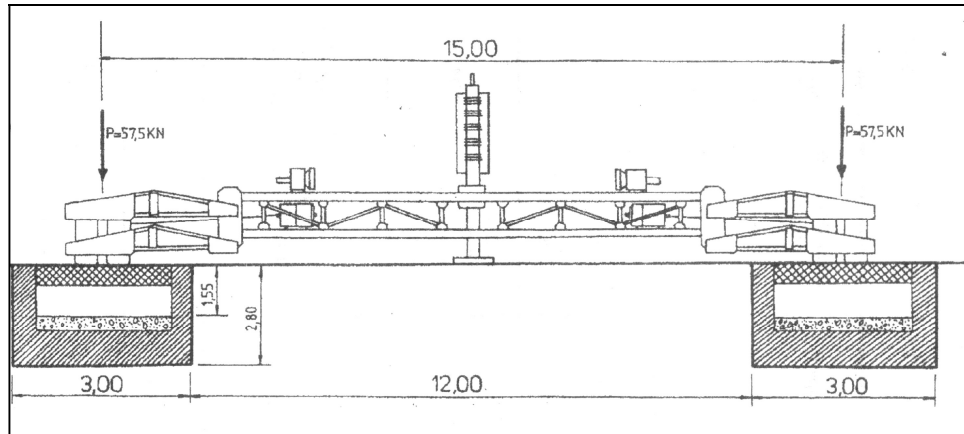


Fig. 2. Testing system – third generation, 1997

The necessity of building a new rolling system, photo 2 and photo 3, was imposed by the introduction in Romania of the etalon vehicle OS-115, in the place of A13 vehicle.



Photo 2 Rolling system

Currently, the rolling system is formed from a rolling arm (a girder with metallic truss member), two subsystems which contain the rolling wheel, photo 4, and two subsystems which have the role of sustaining the rolling arm, photo 5.

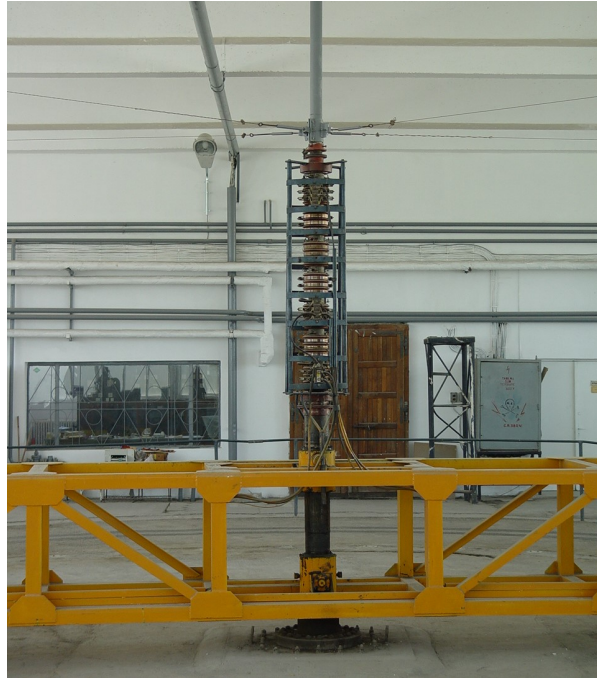


Photo 2 The rolling arm alimentation system



Photo 4 Weal's system





Photo 5 Weal's supporting system

The testing system has these technical characteristics:

- a. Simulated traffic parameters:
  - i. Axle load,  $P = 115 \text{ kN}$ ;
  - ii. Double wheels load,  $P_1 = 57.5 \text{ kN}$ ;
  - iii. Wheel velocity,  $V = 20 \dots 40 \text{ km/h}$ ;
  - iv. Circulated lane width / Number of passes:
    1. On the same trace,  $l = 0.65 \text{ m}$ , photo 6.;
    2. Alternating,  $l = 0.87 \text{ m}$ ;
- b. Track width,  $b = 3.00$ , photo 6.;
- c. Controlled hydrological conditions;
- d. Controlled temperature conditions, ranging from  $T = +30^\circ\text{C} \dots -20^\circ\text{C}$ .

## 2. CLOSING

Between years 1957 – 1982, in the Road Station have been realized 53 testing, which have implied a total circulation of over 7.5 mil crossings of the etalon wheel.

With the installation from the second generation, in 14 years of usage, 1982 – 1997, the rolling system recorded 1.8 mil crossings of the etalon vehicle wheel

A13. There have been realized 23 experimental researches on rigid and non rigid road systems.



Photo 7 Experimental band width and of the circular strip

Currently the station is functioning and in process of improving the automation system.

## References

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