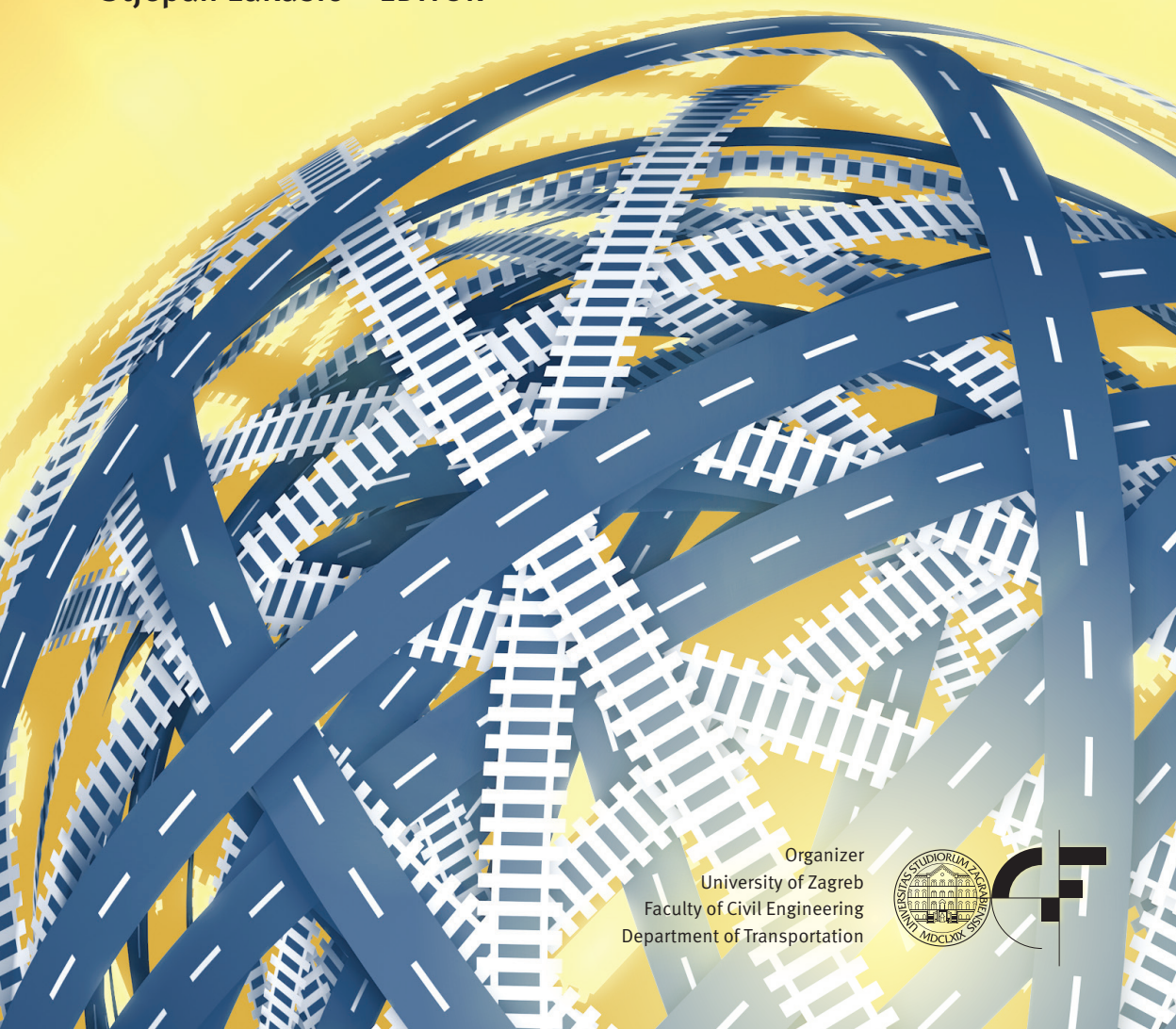
CETRA 2016

4th International Conference on Road and Rail Infrastructure
23-25 May 2016, Šibenik, Croatia

Road and Rail Infrastructure IV

Stjepan Lakušić – EDITOR



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THE SPECIFICITY OF TECHNICAL CONSTRUCTIONS REGIMES INSIDE TERMINALS AND LOGISTICS CENTRES

Krzysztof Gradkowski
Warsaw University of Technology, Poland

Abstract

The paper identifies the main problems with the technical implementation of logistics par in terms of construction. The structure is a par logistics facility construction constitutes a separate area equipped with various constructions, mainly paving of roads and drainage and runoff control system of surface waters. Both construction systems protect the safety in use and structural stability par logistics. Indications and specifications of the basic elements of structural systems par logistic equipment are included in the area of cognitive goals designers and building contractors. Detailed recommendation regarding some technical solutions desaturated surface is essential in order to increase the reliability of solid technical facilities equipment logistics par engineering.

Keywords: roads, railroads, drainage, transition of structures systems

1 Introduction

Intensive development of intermodal and multimodal transport systems requires the construction of new or reconstruction of existing logistics centres. Existing road and rail transport is the primary factor shaping the political systems of individual technical building components within the created logistics centre. From the engineering point of view the basic problem is the construction of a par logistics. The building is equally logistics facility construction constitutes a separate area equipped with various types of buildings, mainly surfaces of roads and the system of control runoff of surface waters from the par [1]. In many cases we have to deal with the construction of multi-storey equally surface in the form of bridges. This type of construction requires separate technical solutions and functional based on bridge structures [2]. As an example of the construction platform entry into the parking lot second level open. Reinforced concrete, steel, and wood can provide various forms of logistics par in the form of an open multi-storey car parks, loading docks, piers, etc. Subject of publication in terms of classical civil engineering, which implies direct desirability of this article involves identifying the basic technical problems arising in the construction of a par logistics. Approximation of these issues in particular designers of such buildings can be very helpful and is independent of the level of detail of their presentation. General description of the problem is in the reference [1].

2 Engineering systems of platform logistics par

The basic equipment of almost every par logistics are surfacing automobile and rail surfaces. They constitute an essential part of functional equal and significantly affect the efficiency of all operational and commercial logistics facilities within the centre. Each kind of surface is part of the transport system and consequently the effectiveness of interconnections becomes necessary. The main engineering challenge is to build a durable surface car-rail. This applies

equally on the surface and equally situated in the concrete structure or steel. Basic assumptions devices construction paving of roads in general are shown in Figure 1. These multilayer systems, the structure and set of material it must be implemented in all conditions.

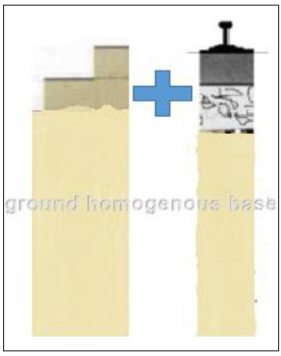

Figure 1 General principle of pavement construction of highways and rail roads

Technical and technological application of the principles of multi-layer construction solutions paving of roads to ensure the safety and stability of the structure itself and secure way to use the full functionality of the logistics par. Any destruction and defects regimes coats equally as automobile and railway leading too difficult to estimate the losses and failures supplies. Operational reliability of these structures is therefore a primary thing. It should be noted that the issue of the proper construction of the road surface, extremely clearly exists for a par logistics structures located on the platforms. Figure 2 shows a typical solution of two types of road surfaces of land located on the surfaces of equal logistics par. Building materials for the construction of these roads are aggregate and cement.

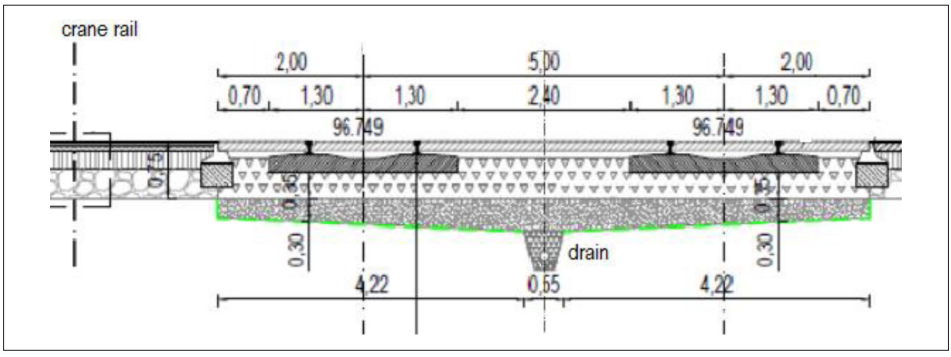

Figure 2 Connection surface paving and rail within the logistics par – technicall solution

3 Draining paving surface on a par

Reliability construction jobs surfacing in the area of equal logistics is closely linked to the drainage system and control the flow of rainwater. The basic criterion for its construction is to ensure the proper performance of the free inflow and receipt collected from the surface rainwater and others. Drainage systems and control runoff are integrally related to the structures and transport surfaces of the substrate. Relatively large areas sealed road surfacing require efficient drains flowing water. Drains can be installed as a point or as a slot, Figure 3.

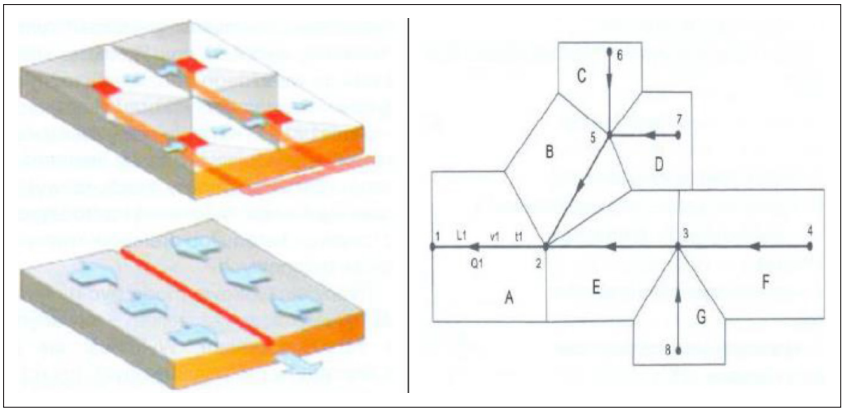

Figure 3 Exsamples of diagrams, drains, surface runoff point and slotted

The main issue in determining the technical solutions to the control system of paving surface runoff and drainage of rainwater is accurate to predict the amount of water feeding the system. The general formula for calculating runoff rainwater is eqn (1)

$$Q = q \cdot F \cdot \Psi \cdot \Phi \tag{1}$$

Where:
Q – amount of runoff [dm³/s];
q – rainfall intensity [dm³/(ha-s);
F – catchment area [ha];
Ψ – runoff coefficient [-];
Φ – delay factor outflow [-].

Equation (1) requires the establishment difficult to accurately calculate the coefficients and delays the trailing drain. The technical solution is generally used flow performance data obtained from the directory. Therefore, the eqn (1) is important for the overall comparison and calculation for the individual and specific technologies for the logistic equal.In practice, very effective solutions are considered to be slotted grooves. Their considerable performance in the reception of water runoff due to the fact of their linear structure. Figures 4,5 and 6 show examples of their installation in pavement construction vehicles or car-rail transition. For obvious reasons, they can only be used in surface regimes surface, with the exception of dehydrated equal par located on the structure. Recommending such outlets stems from practical experience proven in years of use. The efficiency of the technical equipment receiving rainwater and snowmelt has a direct impact on the functioning equally as logistics systems engineering structures. Significant advantages are slotted outlets:
• uniform, stable and repeatable ways of anchoring in the surface layers,
• stenosis technical way demarcation regimes coats of different thicknesses and purpose,
• can be easily supplemented inlets dotted with wells, thereby raising the productivity drain,
• easy maintaining the current.

Figures 4, 5 and 6 are examples of different types of linear grooves slotted for the various types and kinds of road surface.

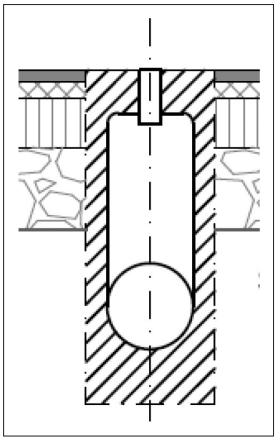

Figure 4 Gully slot-type light

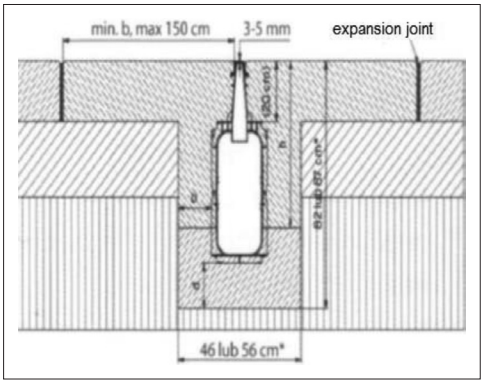

Figure 5 Keyway slot heavy- type version of male

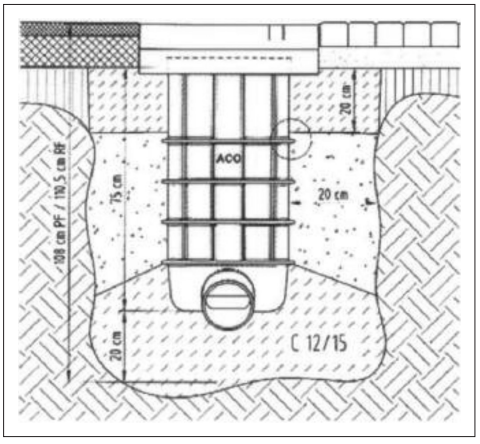

Figure 6 Keyway slot heavy type in the high version.

4 Conclusions

Topcoat pavement, rail and drainage systems design in the field of structures constituting the logistic par are the basic engineering equipment logistics centres. Efficient control systems rainwater protect the safety and stability of the structure coats. Specifications of the basic elements of structural systems equipment par logistics are in the area of cognitive goals designers and building contractors. Detailed recommendation regarding some technical solutions dehydrated surface is essential in order to increase the reliability of fixed technical equipment engineering par logistics. Operational experience shows that the slot structure of the surface drainage outlets are equally effective and adequate to safeguard the security of the entire system of equal surface logistics.

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