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**The use of balustrades on bridges in the light of applicable regulations**

**Abstract:** The author presented the legal status in relation to the use of balustrades on bridges. The analysis presented regulations on technical conditions on bridges and regulations on occupational health and safety. The article attempts to carry out the analysis in such a way that the conclusions are universal and can be applied to all types of objects. It has been shown that the balustrades are an element which protects against falling from a height. This type of collective protection elements should be used when there is a risk of falling from a height.

**Keywords:** Balustrade, Bridge, Safety

**Introduction**

Polish law is subject to constant changes that must keep pace with our changing world. The same applies to regulations concerning broadly understood infrastructure, which often lack consistency. Due to changes in the regulations regarding bridge structures, as well as observations of existing constructions, it has become necessary to specify when protective railings should be used. For the purpose of further analysis, it is established that by a *bridge structure* we mean an engineering structure such as: a bridge, viaduct, overpass, culvert, retaining wall, tunnel, overhead and underground pedestrian crossing, as well as lower and upper animal crossings [2][4][5][7]. At the same time, by a *railing* we mean a structure that protects pedestrians and maintenance personnel from falling from a height, serving as a collective safety measure [5][6].

To ensure that the following study is universal and applies to all structures, only legal regulations are analyzed. All technical standards, guidelines, and internal instructions issued by entities responsible for managing and maintaining the given infrastructure are deliberately omitted. In addition, the intended use of the structure is not taken into account. Therefore, pedestrians and bystanders should be excluded from further analysis. By imposing the above limitations, the analysis focuses on the necessity of using railings to protect the personnel responsible for the maintenance and upkeep of the bridge structure from falling from a height.



1. An object not properly secured against falling from a height

### **Balustrades in Technical Conditions**

In the Building Law [2], Article 5(1) states that:

*A building structure, both as a whole and in its individual parts, together with the associated building devices, must [...], be designed and constructed in the manner specified in the regulations, [...], ensuring: [...] (5) conditions of occupational health and safety, (10) conditions of safety and health protection of persons present on the construction site.*

Therefore, individual regulations regarding the technical conditions of bridge structures will be analyzed first.

In the repealed regulation on the technical conditions to be met by road engineering structures and their location [5], it was specified that:

§ 81. Balustrades on bridge structures should also be used beyond the structure on such sections as to protect pedestrians from falling from a height, if the shape of the road body or the abutment structure does not provide adequate protection.

§ 251.1. Engineering structures should be equipped with safeguards to protect persons from falling from a height if the distance between the surface on which pedestrian, maintenance, or bicycle traffic may occur and the ground level or watercourse bed exceeds 0.5 m.

2. The safeguard referred to in paragraph 1 should be present along the entire length of the structure, even if the circumstances necessitating it occur only on a shorter section. It should not be placed beyond the outer edges of the structure.

§ 252. The height of the balustrade referred to in § 251(3)(1) should be: 1-for sidewalks used by pedestrians and maintenance personnel – no less than 1.1 m,

§ 255(9). In a balustrade protecting maintenance traffic, it is permissible to use, in addition to a handrail, only two parallel elements, one of which should be placed halfway up its height, and the other at a height not exceeding 0.15 m from the plane of the sidewalk or stairs.

§ 307(5). The devices specified in paragraph 1 should be protected on the open side with a balustrade of 1.1 m in height, consisting of a handrail and crossbars placed halfway up the balustrade and at a height of 15 cm from the floor.

In the regulation on technical and construction regulations concerning public roads [7], which replaced [5], there is only a general provision:

§ 92. Devices that protect pedestrians [...] are used on the road if there is a high probability of falling from a height [...] which may result in loss of life or permanent injury.

Meanwhile, in the regulation on the technical conditions to be met by railway structures and their location [4], the necessity for balustrades is indicated in Chapter IV “Railway Structures on Narrow-Gauge Lines”:

§ 84(3). Handrails should be installed on bridges and bridge abutments:

1. when the embankment height exceeds 3 m,
2. when the length of the bridge’s load-bearing structure exceeds 4 m,
3. on all bridges within stations, passing loops, and passenger stops.

As shown in the above paragraphs, the currently applicable regulations do not clearly define when protective balustrades on bridge structures should be used.

By reading the presented regulations, one can see that the legislator has not established a uniform position regarding balustrades on bridge structures. After the repeal of regulation [7], there is no provision that precisely defines the situations in which safeguards preventing falls from heights are required.

### **Health and Safety Regulations and Working at Heights**

In the absence of detailed information in the technical conditions that would allow determining the rules for the use of balustrades, it is necessary to take a broader approach. Given the initial assumption that the personnel responsible for the maintenance and upkeep of the structure will be present on the object, it should be assumed that the bridge structure is a workplace. Therefore, it must meet the requirements of occupational health and safety regulations.

The regulation on occupational health and safety during construction works [6], with respect to protection against falls from a height, states:

§ 6(1). Collective protective measures, in particular balustrades, must be used to secure workstations at heights against falls.

§ 15(2). A balustrade [...] consists of a toeboard with a height of 0.15 m and a protective rail placed at a height of 1.10 m. The free space between the toeboard and the rail must be filled in a way that protects workers from falling from a height.

§ 133(1). Persons at workstations located at a height of at least 1.0 m from the floor or ground level must be protected against falls in the manner referred to in § 15(2).

A similar position is presented in the regulation on general occupational health and safety provisions [3]:

§ 105(1). For the purposes of this regulation, work at height is work performed on a surface located at least 1.0 m above the floor or ground level.

2. Work is not considered work at height, regardless of the height at which the surface is located, if that surface:

(1) is enclosed on all sides to a height of at least 1.5 m with solid walls or walls fitted with glazed windows,

(2) is equipped with other permanent structures or devices protecting the worker from falls.

§ 106(1). On surfaces raised above 1.0 m from the floor or ground level, on which employees may be present in connection with the work performed, or which serve as passageways,

balustrades consisting of protective rails at least 1.1 m in height and toeboards at least 0.15 m in height must be installed. A crossbar should be placed halfway between the rail and the toeboard, or the space should be filled in a way that prevents people from falling out. 2. If, due to the nature and conditions of the work performed at height, it is impossible to install the balustrades mentioned in paragraph 1, other effective measures must be used to protect employees from falling, suitable for the type and conditions of the work.

From the perspective of protecting employees from falls from a height, occupational health and safety regulations are precise and explicitly indicate the necessity of installing protective balustrades.

### **Case Law**

When considering the necessity of using balustrades on bridge structures, an analysis was carried out of various regulations whose applicability to a specific structure may raise doubts. In light of these doubts, reference should be made to a case from the Provincial Administrative Court (WSA) in Warsaw, which found that the Provincial Building Supervision Inspector had the right to invoke the technical conditions [5], even though the case involved a narrow-gauge railway viaduct over an active railway line. The court determined that the viaduct in question could be used by pedestrians and cyclists, and therefore the application of the aforementioned regulations was permissible regarding the use of balustrades and anti-shock shields. The installation of safety features was solely aimed at removing factors posing an immediate threat to human life and health [8].

### **Responsibility for Safety on the Structure**

Having established that there is a need to secure the edge of a bridge structure to prevent people from falling from a height, it is necessary to indicate who is responsible for installing balustrades. In the case of a newly constructed structure, responsibility lies with the designer, whose primary duties are specified in the Building Law [2].

Article 20(1). The designer's primary duties include: *preparing the building design in compliance with the requirements of this Act, the findings specified in administrative decisions concerning the intended construction, the applicable regulations, and principles of technical knowledge; 1aa) [...], ensuring that the safety and health protection principles laid down in the regulations are taken into account during the construction process, considering the specific features of the building design, [...]*

During work on the structure, in accordance with the Building Law [2]:

Article 22. The primary duties of the site manager include:  
3a) *coordinating the implementation of tasks to prevent threats to safety and health protection;*  
3b) *coordinating actions to ensure compliance with the safety and health protection principles set out in the regulations referred to in Article 21a(3) and in the health and safety plan during construction work;*  
3c) *introducing necessary changes to the information referred to in Article 20(1)(1b) and to the health and safety plan, resulting from the progress of the construction work;*

Meanwhile, for work that does not require appointing a site manager, responsibility is defined in the Labor Code [1]:

Article 207(§2). The employer is obliged to protect the health and life of employees by ensuring safe and hygienic working conditions, making appropriate use of advances in science and technology.

Article 304(§4). In the event that work is carried out in a place accessible to persons not involved in the work process, the employer is obliged to take the necessary measures to ensure the protection of these persons' lives and health.

In the case of existing structures, the Building Law [2] specifies in:

Article 70(1). The owner, manager, or user of a building structure, who is responsible for repairs, [...] immediately after the completed inspection, [...] shall remove any identified damage and remedy any deficiencies that could pose a threat to human life or health. From the cited regulations, it is clear that responsibility for safety and health protection is always defined. It must be remembered that there are no provisions exempting anyone from this responsibility.



2. An object properly secured against falling from a height

### Summary

Human life, as the highest value, should be protected in every case. No one should be deprived of protection simply because the technical conditions do not explicitly specify where and when a given protective measure must be used. Although detailed regulations do not define the rules for the use of balustrades, this does not mean the issue can be ignored. Both the Building Law and health and safety regulations place great emphasis on safety and the protection of health. Interpreting the cited court ruling, those responsible for safety on the structure are obliged to apply all relevant regulations to eliminate the risk of falling from a height. Therefore, a bridge structure must be secured with balustrades to protect maintenance personnel from falling. At the same time, it should be acknowledged that pedestrians and bystanders may also be present on the structure and must be adequately protected against falls from a height.

To eliminate factors posing an immediate threat to human life and health, the edges of bridge structures must always be safeguarded with a balustrade 1.1 m in height if the structure is at least 1.0 m above the ground level or the bed of a watercourse. It is important to remember that, according to the Building Law, the owner, manager, or user of a building structure is

obliged to remove any deficiencies (including adding balustrades) that could threaten human life or health.

**Source materials**

- [1] Dz.U.1974 nr 24 poz. 141 z późniejszymi zmianami, Ustawa z dnia 26 czerwca 1974 r. Kodeks pracy.
- [2] Dz.U. 1994 nr 89 poz.414 z późniejszymi zmianami, Ustawa z dnia 7 lipca 1994 r. Prawo budowlane.
- [3] Dz. U. 1997 nr 129 poz. 844 z późniejszymi zmianami, Rozporządzenie Ministra Pracy i Polityki Socjalnej z dnia 26 września 1997 r. w sprawie ogólnych przepisów bezpieczeństwa i higieny pracy.
- [4] Dz.U. 1998 nr 151 poz. 987 z późniejszymi zmianami, Rozporządzenie Ministra Transportu i Gospodarki Morskiej z dnia 10 września 1998 r. w sprawie warunków technicznych, jakim powinny odpowiadać budowle kolejowe i ich usytuowanie.
- [5] Dz.U. 2000 nr 63 poz. 735 z późniejszymi zmianami, Rozporządzenie Ministra Transportu i Gospodarki Morskiej z dnia 30 maja 2000 r. w sprawie warunków technicznych, jakim powinny odpowiadać drogowe obiekty inżynierskie i ich usytuowanie.
- [6] Dz.U.2003 nr 47 poz. 401 z późniejszymi zmianami, Rozporządzenie Ministra Infrastruktury z dnia 6 lutego 2003 r. w sprawie bezpieczeństwa i higieny pracy podczas wykonywania robót budowlanych.
- [7] Dz.U. 2022 poz. 1518 Rozporządzenie Ministra Infrastruktury z dnia 24 czerwca 2022 r. w sprawie przepisów techniczno-budowlanych dotyczących dróg publicznych.
- [8] VII SA/Wa 1226/21 Wyrok Wojewódzkiego Sądu Administracyjnego w Warszawie z 14 października 2021.