

Forest Fires and Building Rules



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Introduction

The Protection of Buildings against Forest Fires

As a rule, the protection of buildings against forest fires is subject to regulation by establishing rules concerning fuel management around buildings and infrastructures. These rules have effectively assumed extreme relevance in the context of fire prevention and the minimisation of their possible damage to lives and structures present at the urban-rural interface (URI). If, on the one hand, fuel management around buildings and structures, and forest management and planning are crucial in preventing and protecting lives and property against fires, on the other hand, the characteristics assumed by forest fires today - namely their dimension, rapid spreading capacity and propensity to reach out more and more to the URI and the structures therein [1] - no longer recommend an approach dissociated from the regulation of construction rules and techniques that are resistant to the building's exposure to fire and to the different risks arising from fires, whether it is direct contact with flames, heat flows or embers and burning particles from fires [2]. This is without prejudice to the challenge that the incorporation of technical guidelines poses to the law, as occurs in the legal regulation of materials and construction techniques.

Additionally, the relevance of the buildings and infrastructures located in the URI and their protection in the context of rural fires has been increasingly notorious, taking into account the use for which they are generally intended: whether for housing - with such buildings playing an important role as a place of refuge and protection of lives [3] - whether for a wide range of economic activities. However, specific safety rules for buildings themselves against forest fires, aimed at reducing their vulnerability, are rarer or even non-existent, especially in the European and Portuguese context. The existing legal regulations in this scenario regarding the protection of buildings against fire - the case of the European Construction Products Regulation and the Portuguese Legal Regime on Safety against Fire in Buildings - has, essentially, as

object, the fires originated inside them, taking into consideration, mostly, risk factors of deflagration and propagation of this specific type of fire, being concerned with establishing standards that should be attended by the construction materials and equipment used, especially inside the buildings. These are rules that apply to all buildings, regardless of their location, since all of them are vulnerable to fire. However, as we know, this vulnerability is more pronounced in buildings located in areas prone to forest/rural fires: in these cases, the risk of fire also comes from outside, making it necessary to place new demands on building projects, whether in terms of their surroundings, their very architecture or, finally, in terms of the construction materials to be used. This does not mean that the existing standards are not equally relevant in the prevention of fires coming from outside the buildings; however, the value of these standards is, from this perspective, more limited. Considering this brief background, the present text aims to present, in a very summarized manner, the construction law rules that are aimed - or may be used - at protecting buildings against forest fires in Portugal.

Construction Law Rules Relating to the Protection of Buildings against Fire

The European Construction Products Regulation

At European level, issues concerning the protection of buildings are regulated by the European Construction Products Regulation [Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011], which establishes conditions for placing or making available on the market construction products, as well as the harmonisation of rules on the expression of performance of construction products and on the use of CE marking on such products. Specifically in relation to the issue that concerns us here, the aforementioned Regulation highlights in its Annex I that fire safety is one of the basic requirements of construction works, which should be designed and built in accordance with certain fire safety requirements.

However, as we mentioned, these requirements essentially consider fires originating inside the buildings themselves, namely in terms of load/support capacity, generation and propagation of fire and smoke, limitation of the propagation of fire to adjacent buildings, guarantee of adequate evacuation of the occupants and levels of safety for rescue teams.

Reiterating the convergence of the requirements listed in the European Construction Products Regulation, Annex IV, when dealing with the range of products and requirements applicable to Technical Assessment Bodies (TABs), lists products whose practical utility is essentially geared towards preventing, detecting, and limiting the spread of fire within buildings, such as fire alarms and fire stopping products¹. Although the regulations are essentially aimed at the interior of the building, we cannot forget the importance that some of these requirements assume regarding external ignition sources, namely from forest fires. This is the case, for example, of the value of fireproof products (such as fire doors) - namely those also aimed at the outside of buildings, which prevent sparks or small embers from entering the interior of a building - and of the importance of fixed fire detection and combat systems inside buildings. These are, in fact, requirements capable of minimising damage, should any incandescent material enter the interior of the building and start a fire. These rules, however, are (or can be) not very effective in what concerns the contact of the building with flames coming from outside.

Also, with a view to protecting buildings from the entry of sparks or burning embers, special attention should be paid to windows, chimneys and building ventilation systems. It is also important to highlight, in accordance with European regulations, the characteristics of the materials from a perspective of (i) reaction to fire; (ii) resistance to fire; (iii) and performance in relation to external fire: despite their value for the resilience of the construction to fires of external origin, they fall within the cases in which the reference to harmonised technical specification relevant for their marketing is not required (according to paragraph 3 of Annex V of the European Construction Products Regulation).

The Portuguese scenario

At national level, the Legal Regime of Safety against Fires in Buildings - SCIE (Decree-Law no. 220/2008, of 12th November), is the diploma that regulates the minimum standards of construction materials and equipment of a building, considering their specificities and using criteria such as product characteristics, materials, as well as the identification of risk locations or categories. It also contains, in its essence, a regulation focused almost exclusively on the protection of buildings against fires originating in the building itself and their propagation, not considering the levels of risk of rural fires or the heat flow from them to which the building may be subjected. It should be noted, in this respect, that the Legal Regime on Safety Against Fire in Buildings uses, for the identification of risk locations, criteria related mainly to the type and number of the public, the

characteristics of the existing products, materials or equipment and the location of the means, but it does not consider aspects such as the location of the building and its surroundings.

As a result, its usefulness for protecting buildings against the risks of forest fires is reduced, and its application in these contexts is not envisaged. However, as we mentioned regarding the European regulation, we cannot fail to point out some use of the safety measures provided therein for cases in which external incandescent particles may result in an ignition inside a building. In this regard, the recent Order 8591/2022, of 13 July, prepared in the scope of the Integrated Management System for Rural Fires (SGIFR), has greater relevance, and is applied for the purposes of regulating the building restrictions established by this law, namely those provided for in subparagraph iv), paragraph b), paragraph 2, of Article 60, and in subparagraph c), paragraph 1, Article 61. The requirements set out in this order seek to adopt measures to protect buildings from fire, considering the performance of construction elements and materials in the case of buildings exposed (or vulnerable) to rural fires.

Thus, the Order 8591/2022, of 13 July innovates in the Portuguese context by regulating the use of building materials taking into consideration the risk of rural fire and, mainly, by establishing a classification of fire risk of a building individually considered - which may correspond to the risk class low or medium, high or very high and extreme - this classification serves to guide the standards that must be met by the construction elements, which are essentially two: fire resistance and fire reaction. As for the first, the aforementioned Order establishes the need for the structural elements of buildings to meet certain standards of fire resistance (article 5), as well as the requirements to be met by skylights, exterior doors and windows (article 8), whenever the Separation Distance (SD) between the nearest vegetation and the building is less than 50 metres.

As for fire reaction standards, wall coverings, doors, windows, skylights and elements for enclosing external openings are subject to compliance with certain classes of reaction to fire whenever the SD is less than 50 metres (articles 7 and 8), as well as roofs and coverings when the SD is less than 300m (article 6), the classes varying, in the latter case, according to whether or not the construction is located in an APPS (Priority Areas for Prevention and Safety, that correspond to the "high" and "very high" rural fire hazard classes, based on the hazard map produced by the Institute for Nature Conservation and Forests).

However, as the diploma itself makes express reference, the Rural Fire Exposure Class (CEIR) classifies the risk of fire taking into account only the exposure of the building to heat flux based on the fuel scenario where the building is located and the average slope of the terrain, which seems manifestly little because it is only one of the risks to which the buildings in the IUR are exposed in case of forest fire. Although the Order 8591/2022, of July 13 represents a relevant step in the regulation of constructions taking

into consideration risks from forest fires, there is still a (long) way to go, both in what concerns the valuation of the type of vegetation that is close to the construction and the possible specification of the constructive criteria, as in what concerns the consideration of the relevance of the building design and not only the construction materials, besides the consideration of other risks, taking into consideration that in Portugal most of the most serious damages that occur in constructions are related to the contact of fires with embers carried by the fire, which start new fires in the property, or with the direct contact with the flames.

Moreover, and specifically regarding Order 8591/2022, some doubts arise regarding the identification of the situations in which it applies:

a. from the outset, the same will apply only to new constructions or to interventions permitted by the current Rural Fire Management System, under the terms of Articles 60 and 61 of Decree-Law No 82/2021 of 13 October, which means that the “scope of protection” of the measures in that Order will leave out a whole range of urban operations that were previously carried out and which therefore still require adaptation to measures to strengthen their “resilience” to fire. It is therefore urgent to find ways and programmes to adapt buildings in areas with a greater propensity to rural fires, which, in the analysis of the Collaborative Laboratory for Integrated Forest and Fire Management, would have a total cost in the order of 300 million Euros, but which would be greatly justified in a country with the level of occurrence and devastation resulting from fires, such as Portugal.

b. on the other hand, it lacks interpretation to know what the separation distance (SD) refers to concretely, seen as the distance between the nearest vegetation and the building. In other words, it remains to be directly determined what type of vegetation we are referring to and if it is enough that a fuel management strip is foreseen around the building for it to be considered that the separation will be (even if dynamically) ensured within 50 metres (or in a smaller or larger area). In this regard, the Framework Document version 1.0 - July/22, explains that “the scenarios used refer to land with herbaceous plants with an average height of 20cm, with and without trees, and land with shrubs with an average height of 50cm, with and without trees”. The same results from the criteria for the determination of the class of exposure to rural fire, under the terms of the Annex to the Order, which refers to five scenarios, being that these will be the guidelines for the application of the Order and will have to be objectively characterised (and calculated, in case there are several vegetation patches), and not the obligations that will result from the imposition of fuel management strips.

c. It was not clearly determined, beyond the provisions of the Order, what the measures related to the containment of possible fire ignition sources in the building and respective yard and accesses (mentioned in article 60, n.º. 2, paragraphs a) v) and d) iii), and article 61, n.º. 1, paragraph d) of the SGIFR) can adequately consist of. No specific self-protection measures are mentioned (water hydrants, sprinkler lines), as well as their suitability (advantages and disadvantages) to minimise rural fire ignitions or their effects, nor the control of their installation in the building. Therefore, regarding these elements, we are left in a legal undefinition, and although these measures should be proposed, there are no indications about which ones should actually be foreseen in view of the situation of the building, entering a space of technical “discretion”, hardly controllable. The same may be said about the risk analysis mentioned in article 61, no. 3 of the SGIFR.

Conclusion

It can be concluded that the safety of buildings against forest fires is not yet sufficiently considered in the Portuguese legal regulations, although the existence of specific provisions for the construction of buildings and infrastructures resistant to forest fires is starting to be a reality. It is necessary, however, to develop this regulation and stabilise practices that enable the way of its application, with due cooperation between public and private entities, to achieve a shared goal.

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