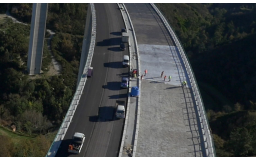


DURABLE BUILDINGS
TRUSTED SOLUTIONS

WATERPROOFING BRIDGE DECK PROTECTION

Viaducto do Marao Bridge, Portugal.



ALCHIMICA's advanced and safe solutions for fast and durable application

Building Bridges - Connecting Lands



Bridges serve as essential architectural structures, linking two distinct landmasses. Their purpose extends beyond mere connectivity, facilitating human interaction, trade of goods, and the sharing of cultural practices. Since the dawn of civilization, bridges have held pivotal roles in shaping geopolitical landscapes, strategic considerations, and economic progress, often acting as determinants of a city's overall prosperity.

Although they are considered important for people's lives, at the same time they are vulnerable structures that need constant maintenance and protection.

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Bridges withstand a multitude of pressures and mechanical stresses throughout their operational lifespan. In these significant and critical architectural constructions, a range of factors led to substantial deterioration of the concrete foundations. This deterioration is appeared as concrete erosion and corrosion of reinforcement bars. Therefore, ensuring the waterproofing, protection, and sealing of both bridge decks and construction joints, emerges as a necessary effort during the construction phase.

Specifically, climatic harsh conditions are playing a significant role on the durability over bridges lifespan, especially in areas where salt is used for melting the ice in frozen periods, being in fact detrimental to the concrete and structural reinforcement.



In addition, due to the dynamic traffic loading the selected product-system should hold great elasticity and crack-bridging properties.

Viaducto do Marao bridge

Project size: 150.000 sq ft (150000m²)

ALCHIMICA products used:

- Priming - GEODESMO-50
- Sealing - HYPERSEAL®-EXPERT-150
- Waterproofing - Hyperdesmo® system

ALCHIMICA SOLUTIONS

ALCHIMICA's bridge deck waterproofing system based on HYPERDESMO® system was selected as the ultimate solution for the protection of the Viaducto do Marao bridge in Portugal.

During the period of February and March 2016, the selected system applied taking into consideration the following requirements.

The huge, single cell rectangular box girder was 29.5 meters wide with gradual banking that changes from left to right as the bridge follows an S-shaped path as it crosses the deep Marbo River valley. The wide side dimension needed the waterproofing application to be seamless, fast, self-levelled with the appropriate adhesion. Durable Waterproofing and joint sealing were the specific requirements needed with elastic crack-bridging properties, strong chemical resistance, and strong bonding. Sealing should also prevent water from entering the structure and provide the joint systems the stability to prevent movement flexibility in harsh weather and temperature conditions.



Priming:

The GEODESMO-50 was used for priming as it offers deep penetration to concrete porous substrates, sealing all the vertical and horizontal parts of the structure. Taking into consideration that the system application should be completed, fast and easy at a strict schedule and timeline, to avoid any weather implications such as rainwater and big percentage of humidity. In that way, the GEODESMO-50 with its fast-curing time, even after 2-3 hours, makes it the best recommended choice for the project. Although the material has such a fast-curing profile, it has a good memory also. GEODESMO-50 can be applied with a brush or roller with consumption of 200 ml/m² on concrete.



Sealing:

Concrete joints especially in the bridge decks are facing many challenges from constant movements due to thermal shifts, to persistent vibrations, traffic-induced mechanical stresses and corrosive de-icing chemicals. To effectively keep water out of the structure and prevent any potential erosion of concrete and corrosion of steel components we used the certified polyurethane HYPERSEAL®-EXPERT-150 as a seal to the parapet walls, gutters and the numerous cut-construction and connection joints.



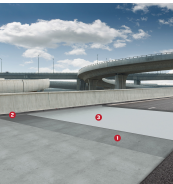
Waterproofing

HYPERDESMO® polyurethane membrane was the most advanced and safe solution for the waterproofing of the bridge construction as it has been used for the waterproofing of new and existing bridge decks in major projects around the world.

HYPERDESMO® system can be applied under asphalt, as it withstands the temperature of +200 C for a short time (up to 4 hours). It was not necessary to protect the HYPERDESMO® waterproofing layer with a concrete layer - which significantly reduces the cost of waterproofing. In addition, the system displays excellent mechanical and chemical resistance, can withstand petrochemicals and salts that commonly attack bridge decks.

Another important benefit is that HYPERDESMO® has a seamless coating uniform membrane thus the fewer seams and joints, the lower the probability of failures in the future. During the application in the Viaduto do Morão bridge the material applied easy both by roller and spray maximizing efficiency and minimizes errors.





- 1 **PRIMING**
HYPERCEMENT 7
AGGLAFAST 200
- 2 **SEALING**
HYPERSEAL-EXPERT 100
- 3 **WATERPROOFING**
HYPERCEMENT 200

The resistance of HYPERCEMENT 200 to salts as well as to thermal shocks (shock temperature up to 200°C) constitutes the most advanced and safe solution for the waterproofing of bridge decks.

We are crossing the bridges of innovation by offering advanced quality products that combine efficiency, workability and heavy-duty performance.



