

Romagna shopping centre

The roof was refurbished with MAPEPLAN T M waterproofing system



In summer 2013, the waterproofing system on the roof of a shopping centre located in Savi-gnano sul Rubicone, just outside Rimini (Central Italy) was refurbished. The installation work of the new waterproofing system was carried out over the August-September 2013 period. The work involved two buildings belonging to the Romagna shopping centre, which is home to a number of shops. Work was carried out on a total surface area of around 6,400 m². The two buildings are over 5 and 10 m high, respectively, and both had trouble with widespread leaking.

The buildings' roofs were waterproofed with the fully exposed application of a 2.0 mm-thick TPO/FPO membrane called MAPEPLAN T M, secured with a mechanical fastening system.

The abundance of air-conditioning equipment, pipework and ducting elements on the roof, along with a somewhat sizeable sign mounted on a weighted base, was a critical factor in the project and made for a more complex work process.

Requirements of the waterproofing system

With refurbishment work being performed on flat roofs on a building over 10 m high located in an area overlooking the sea, and with approximately 1.5 m high parapets around the edge of the roof, this was a relatively complex project entailing careful calculations when it came to the mechanical fixings required to withstand the wind uplift force. When dealing with roofs of this kind, extra care is required to ensure that there are no problems with rainwater being drained away, especially given that rainfall intensity is often exceptionally high in the area. The refurbishment project was carried out without disrupting the business of the shops underneath. Energy efficiency and the desired longevity of the waterproofing membrane were also factored into the job. Adopt-

ing a refurbishment system that would allow to leave the old membranes in place, so as to take the hassle of disposal out of the equation, proved crucial since total removal would not only have been expensive, but would also have complicated the project and meant more time on the job.

The MAPEPLAN T M solution

To comply with the rules and meet the client's requirements, Polyglass (a subsidiary of the Mapei Group) proposed a waterproofing system comprising a TPO/FPO flexible polyolefin synthetic membrane called MAPEPLAN T M, as described below. The roof had a lightweight screed waterproofed with a bitumen membrane. Following specific tests to determine its density, the best solution for fastening the MAPEPLAN T M membrane turned out to be the use of self-tapping screws. The contractor was provided with density calculations and screw positioning with a detailed map, put together by the Polyglass Technical Services Department, based on a precise calculation of the wind uplift force, in compliance with current regulations and Eurocode requirements. The installation surface was prepared by removing all irregularities (blisters, wrinkles, etc.) in the existing membranes and laying a levelling layer of POLYDREN, comprising a nonwoven material with a density of 300 g/m² to ensure a flat surface. The rainwater drainage system was reinstated with new drains and new connections to them. MAPEPLAN T M membrane was loose-laid with the sheets overlapping by approximately 12 cm; the overlaps were thermally welded with hot air using specific automatic and manual welding equipment. The roof was finished off with flashing and fastenings to the parapets in addition to walkways produced using the MAPEPLAN T WALKWAY membrane so that maintenance personnel can get to the building's services equipment.

Technical Data

Romagna Shopping Centre,

Savignano sul Rubicone (Italy)

Year of Construction: 2005

Year of Intervention: 2013

Intervention by Polyglass:

supplying products for refurbishing the waterproofing system on the roofs of two buildings

Client: IBS Srl – arch. Sandro Balsamà

Laying Company: Edilasfalti Srl

Polyglass Co-ordinator: Mauro Redemagni, Polyglass SpA (Italy)

Mapei Products

Refurbishing the roofs' waterproofing system:

Mapeplan T M TPO/FPO flexible polyolefin synthetic membrane for waterproofing exposed roofs, manufactured to meet harmonized standard EN 13956; Mapeplan T Walkway; Polydren; Mapeplan T accessories.

These products are manufactured by Polyglass SpA, a member of the Mapei Group.

See website www.polyglass.com for technical data sheets.

PHOTO 1. The shopping centre's roof before the intervention.

PHOTO 2. Laying the MAPEPLAN T M membranes.

PHOTOS 3, 4 and 5. View of the roofs after completion of the works.



FEATURES AND ADVANTAGES OF THE MAPEPLAN T M SYSTEM

The MAPEPLAN T M waterproofing system comprises a UV-stable and weather-resistant TPO/FPO flexible polyolefin waterproofing membrane featuring a mechanically very strong internal polyester mesh carrier specifically designed and manufactured for fully exposed membrane systems, secured with a mechanical fastening system. Its advantages are:

Loose-laid system with mechanical fastening system

The loose-laid system used for all layers in the roof build-up offers the advantage of being able to absorb the substrate's movements and expansions without them affecting the waterproofing membrane, which can slide accordingly. Consequently, splitting, cracking or any other defects that might occur in the cast concrete substrate cannot damage the waterproofing membrane. Loose laying also allows checking the waterproofing membrane's seams and surfaces using the "tracer gas" system, which is also used to detect leaks.

Securing the waterproofing membrane with a mechanical fastening system has the advantage of fixing the waterproofing membrane safely directly to the load-bearing structure underneath.

What enables the membrane to withstand negative wind pressure is actually the specific mechanical fixing system, which is calculated and sized to meet Eurocode requirements based on actual job conditions, such as:

- building height and shape
- positioning, location
- type of substrate
- type of waterproofing membrane and carrier
- design wind speed.

Compliance with harmonized standards

The MAPEPLAN T M waterproofing membranes have been manufactured and certified to meet the European harmonized standard EN 13956; MAPEPLAN T M can contribute points to obtain the LEED (Leadership in Energy and Environmental Design) certification.

"Multi-extrusion coating" production process

MAPEPLAN T M membranes are manufactured in a modern, technologically advanced and environmentally friendly "multi-extrusion coating" plant.

This innovative production system allows the TPO/FPO synthetic matrix to be applied directly and at the same time to both faces of the polyester mesh carrier in one go, thus ensuring that it is incorporated perfectly in the membrane's structure.

This special production process means MAPEPLAN T M membranes are not prone to delamination problems, as they qualify as single-ply membranes that offer excellent resistance to foreseeable (physical, chemical, thermal) stress.

Plasticizer-free formulation

MAPEPLAN T M is an innovative waterproofing membrane formulated without plasticizers or volatile substances.

Built-in flexibility

The MAPEPLAN T M membrane gets its flexibility from the special chemical structure of its polymer component: the element that makes it so flexible is in the molecular chain and is "chemically bonded" to it.

This chemical bond is very strong and difficult to separate, which makes the membrane's inherent qualities last longer, with higher resistance to aggressive substances, as well as improved weathering resistance and resistance to microorganisms and bacteria.

Dimensional stability

Dimensional stability is ensured by the internal polyester mesh carrier and by the "multi-extrusion coating" production process.

Highly eco-friendly with low environmental impact

MAPEPLAN T M has impressive green credentials since it is free from plasticizers and volatile substances and does not contain substances that are dangerous or harmful to people or the environment.

The modern and technologically advanced production system has been designed and built to deliver the lowest possible environmental impact. This low environmental impact is guaranteed during all stages of the membrane's life cycle: manufacture, transport, installation, service life, end-of-life disposal.

Once the waterproofing membrane reaches the end of its life cycle, it can be removed and recycled/reused to produce new raw material.

Smart White surface colouring - signal layer

MAPEPLAN T M has a special white top layer, which gives the product its excellent solar reflectivity and reduces roof surface temperature by over 50% compared to a dark/black-coloured roof, which has clear benefits in terms of comfort due to the building's lower indoor temperature.

The different colour on the membrane's surface also has the advantage of acting as a signal layer, highlighting any accidental mechanical damage or surface scratching resulting from works carried out once the membrane has been laid.

Thermally welded seams

The MAPEPLAN T M waterproofing membranes are thermoplastic elastomers, which means they have excellent weldability properties and are thermal welded with hot air. This welding method effectively fuses and bonds together the molecular chains: the welded MAPEPLAN T M membrane's seams withstand the pressure of the water and are mechanically strong.