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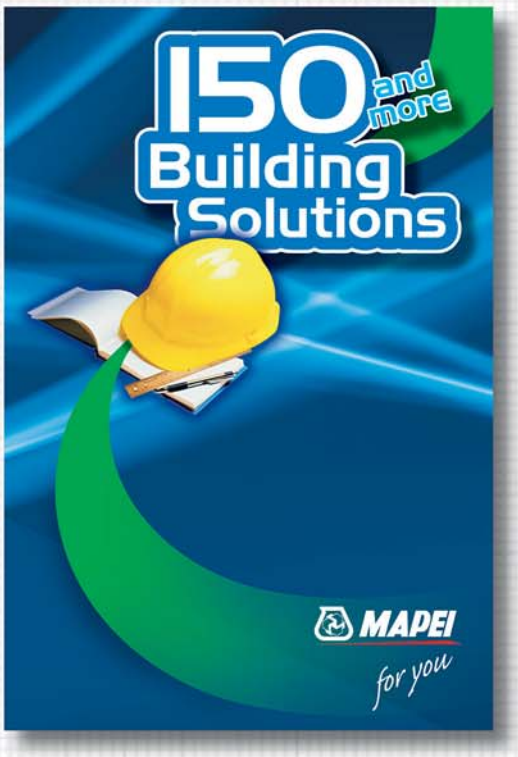
16

THE NEW "150 SOLUTION FOR BUILDING AND MORE" HANDBOOK



A little handbook entitled "150 Solutions for Building and more" will soon be published in English out of the Italian counterpart "150 e più Soluzioni per l'Edilizia".

A CD-Rom version will also appear and its contents is intended to be made available on the web at www.mapei.com. "150 Solutions for Building and More" results from the updating and upgrading of a former little handbook called "150 Solutions for Building", which was an instant success and a best-seller in every country where it was published. This handy little book, which provides useful guidelines about how quickly deal with the most frequently arising building problems, has now been updated based on advice from people working in the industry, who soon realised just what a vital help it is. New subjects have been added, such as the laying of resin-based floors and wall finishes.

The handbook's contents are set out so that the operation to be performed can easily be found starting from the cause or problem arising on the site. After initially selecting the job in question, divided up into the main operations involved (i.e. repairing concrete, structural bonding, consolidating concrete and masonry, etc.), the reader has just to turn to the page describing the procedure to be followed. The text are deliberately brief and concise, outlining the working method and materials involved.

The CD-Rom version is a natural consequence of Mapei's ongoing ability to make the most of modern technological tools. It is set out to make it easy to "surf trough", so that trouble shooting is quick and easy: it just takes a click on the mouse to get the right job on the screen. In each case the chart only deals with one kind of job, there are then hypertext links to other pages providing further information. This is the case, for instance, with all the products referred to, whose relative technical data sheets can be looked up or printed out, as required.

The decision to make the contents of "150 Solutions for Building and more" available on the web reflects Mapei's long-lasting keen eye for technological innovations and its ability to look forward to the future and upgrade.

Although this new tool certainly provides all the information required, Mapei believes that such operations need to be assessed on a case-to-case basis to avoid any mistakes in selecting products that might spoil the work being carried out. No book or electronic aid could ever take the place of a direct assessment by a "materials technician" working and deciding on-site.

Summary

EDITOR
Adriana Spazzoli

ENGLISH TRANSLATION
Martin Anderson, Nicholas John Bartram,
Trans - Edit Group

COORDINATION:
Metella Iaconello

EDITORIAL ASSISTANT
Carla Fini

GRAPHIC DESIGN AND ART DIRECTION
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COLOUR SEPARATIONS AND LAYOUTS
Overscan - Milan (Italy)

PRINTER
Arti Grafiche Beta - Milan (Italy)

EDITORIAL ADDRESS:
MAPEI S.p.A.
Via Cafiero, 22 - 20158 Milan (Italy)
tel. ++39/02/376731 - fax ++39/02/37673214
Internet: http://www.mapei.com
E-mail: mapei@mapei.it

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Main cover photo:
The Teatro alla Scala in Milan reopens after 912 days of work renovated and restored (article on page 2).

www.mapei.com

The Mapei site contains all the information about the Group's products, its organisation in Italy and overseas, its involvement in the sector's main trade fairs and lots more.

My father Rodolfo took me to the Scala for the first time in 1956: Maria Callas, Mario Del Monaco and Giulietta Simionato were reciting in The Norma, which for me was, and still is, a memorable performance.

20 years after losing my father, I still leaf through the opera programmes where he used to jot down notes, and it is as if I were with him again, together on a fantastic, itinerant musical voyage through the masterpieces of opera.
His slightly faded handwriting, yet still decisive and elegant, often leads me back to the Scala.

Today, the most famous Opera House in the world is reborn, thanks also to the contribution of Mapei, something which I feel sure he would have wanted.

To my father Rodolfo, who passed on to me the passion for opera and music, and who taught me to tackle all tasks, whether small or large, with seriousness and enthusiasm, I dedicate this memorable moment.
To be Milanese who looks out towards the world was his unspoken lesson.

His Scala is more beautiful than ever, and the city of Milan, which he so loved, has rediscovered one of its most precious jewels.

Giorgio Squinzi

Mapei and the Teatro alla Scala
The Art Of Work

7th December, 2004
the Teatro alla Scala reopens after 912 days of work
renovated and restored

It may seem an etymological contradiction in terms to associate art with work. Art means talent, the ability and masterly skill which exalt the quality of man's application. It would not appear to have anything to do with the real sense of the word "work", whose meaning often implies fatigue, effort, breathlessness. However, the capacity of conjugating these two concepts, which on the surface would appear quite distant, is the mission that Mapei has always pursued and which has decreed their success all around the globe.
A work of art is born out of the effort and fatigue to render an idea well-known, to turn a dream into concrete reality. Command of technical know-how is the premise when constructing a company.
Striving for ever more advanced solutions makes it possible to explicate creative actions.
So, as a true artist would say that art can not be without hard work, Mapei has always been strongly convinced that work may never be separated from art.
This strongly enrooted conviction has been expressed over the years with constant attention and increasingly masterful skill, towards the needs of "places of art". Whether we are talking about working in one of the great museums or simply rendering a medieval basilica more stable, the skill and technology, which is the fruit of Mapei's research, have contributed in making some of the most important arts and cultural centres more alive and long lasting, both at home and abroad. Activity at an international level which, nonetheless, has never allowed Mapei to distance itself from the special attention it pays towards the territory which has witnessed its growth: Milan. The rebuilding and renovation work of the Teatro alla Scala is the most recent and most prestigious example in which the entirety of Mapei's skill, technology and research have been put into practice. And the company's great love of the Arts.

Birth and Rebirth

On the 25th of February, 1776 a blaze destroyed the Teatro Regio Ducale in Milan, which at that time was the historical site for opera performances in the city.
Giuseppe Piermarini, Royal Imperial Architect for works and factories for the entire Lombardy region, took just 40 days to design the theatre that would be built, at the express wishes of Empress Maria Teresa of Austria, on the site of an old church instituted by Regina della Scala, the wife of Bernabò Visconti.
And thus the Teatro alla Scala was born.
Yesterday, just like today, the hard work and generosity of the inhabitants of Milan, and of all those who have spiritually adopted Milan, represent the deep lying roots of the Teatro alla Scala. In the case of the Teatro Regio Ducale, the building costs were initially met by the box holders, just as a large part of the cost of today's renovation, which has turned the theatre into a jewel in the crown of world music, has been met by the Milan inhabitants of the new millennium, and by the cosmopolitan melting pot of lovers of music and art. Amongst which, citizens, Institutions and companies, such as Mapei, which were firm believers in this project.
On the 3rd of August, 1778, after little more than two years of hard work, the new theatre was inaugurated with a rendition of Antonio Salieri's "L'Europa riconosciuta", with an accompanying libretto by Mattia Verazi.
Just as now, in the new millennium, little more than two years were enough to bring the theatre back to its original splendour and to give it a new life.
This year, on the 7th of December, the Scala was inaugurated again, with the same opera by Salieri.

The Evolution of a Masterpiece

Foscolo was the first to exalt the correct form of the stalls in the show arena, to optimise the sonority, to take great care in the spectator's view and the comfort of the boxes, with intelligent positioning and layout of the corridors, the halls, the entrances and the service areas.
With the passage of time, the Scala has become not only the most important opera house in the world, but also the very symbol of the city of Milan, the irremovable driving force around which the city has grown and developed.
Rome, Paris, Florence, London, Vienna, Budapest…..the most important and most beautiful cities in Europe have a grand river which flows through their hearts. The waterways, which work their way through the houses and monuments of these cities, make them more alive, as if the incessant flow of the water were also purifying the actions and work of the people who inhabit them.
Milan does not have a river running through it, and even the Navigli, a series of artificial waterways which up until a few years ago enlivened the city, have been all but completely covered over. But only Milan has the Scala. Depriving the city of its waterway has been compensated for by an invisible, yet equally noble, fluidity: of music. And the Scala is the precious jewellery box from which flow the notes and harmony which dictate the rhythm of the city.
From the 31st of December, 2001 until the 7th of December of this year, Milan has not been able to reap the benefits of this positive energy, which once flowed out from its most famous theatre.
The enforced closure, which lasted a total of 912 days, was essential in order to carry out a complete restoration and renovation of the theatre and to redesign the layout.
The poor environmental conditions of the theatre had already been highlighted in 1991, when the then Superintendent for Cultural Resources, Lionello Costanza Fattori, had advised upon the necessity to create new spaces "which meet today's new technical and structural requirements" and declared that he was "on the whole, in favour" of a restoration operation. To put it into more technical terms, the Scala was no longer "up to modern standards". The level of safety was no longer acceptable, after more than a decade of postponements which were only too tolerant and accommodating.
The glamour and fame of the theatre were simply no longer enough to permit the safety of its employers and spectators being put to risk.
The life of the theatre was at a crossroads, with a choice of two directions. The first one, theoretical and unacceptable, was to close the theatre and turn it into a museum dedicated to itself: a noble, yet sterile and sad monument to the history of the theatre and to the glory of Milan. As the Mayor of Milan, **Gabriele Albertini**, so eloquently put it, it would have been like "committing cultural euthanasia".
The second and most courageous choice, and the one which was finally taken and

put into practice, was, as again described by the Mayor, to bring the Scala back to being "a grand structure, but alive and up-to-date, a modern churning pot of art and beauty".

The project foresaw a conservative restoration of the monument area and rebuilding of the stage tower, the stage service facilities and of the offices. Two new structures were also created: the ellipsoid dome, decorated with Botticino marble, which houses a series of dressing rooms and rehearsal rooms, and a new, large scenery area, a technologically avant-garde facility.

The scenery apparatus is housed backstage and is the real heart of the new Scala. The structure is the only one of its kind in the world, and allows for both horizontal and vertical movements of the scenery and, therefore, a number of shows and changes of scenery may be catered for at the same time.

Piermarini, who excelled in the study of mechanics and astronomy before becoming the most renowned architect of his time, would certainly be surprised if he could only see his theatre as it is today, with all the innovative solutions which, without completely revolutionising his original structure, have restored to the world a theatre which is even more beautiful and attractive than before.

And for those who so wish, it is through the Scala that one may understand that subtle bond which joins the three sciences so loved by Piermarini and which here is applied to music: mechanics, architecture and astronomy. A place which has been born to display the Sublime.

Mapei on Site

Mapei's technology, experience and products have been employed both in the monument area and for the new constructions. For example, a number of samples of the theatre's gold-leaf decor were analysed in Mapei's research laboratories, so that the restoration of these priceless ornaments could be carried out as faithfully as possible.

As **Elisabetta Fabbri**, the architect who coordinated the work carried out in the monument area, is quoted as saying: "even the characterisation of the gold (in the hall) was carried out by careful laboratory analysis, which helped us define the characteristics of the gold still in use, and therefore to suggest the most appropriate techniques for the operation".

The result of such an incredibly detailed operation means that: "restoration of the gold-leaf, and the repair and renewal of missing patches of gold, are the operations which have brought the hall back to its antique splendour". However, the fronts on which Mapei demonstrated their experience were numerous and, in the following pages, a synthetic yet exhaustive technical report will be given. The whole undertaking may be considered to be of epic proportions, and the entire staff of Mapei's experts are overwhelmed with emotion when they remember the grandiosity and complexity of the work carried out. The phrase which was most widely used when they came back into the company was: "you've got absolutely no idea of the magnitude of what is being carried out". This concept was expressed in more technical terms by **Antonio Acerbo**, Works Director and Safety Coordinator during the operations, when he stated: "It is particularly creditworthy the short amount of time required to demolish the existing stage tower and service facilities (80,000 m^3) and to rebuild the new structure (180,000 m^3), not to mention the awkward on-site logistics, which meant that all the materials had to be evacuated and brought in day by day, working 24 hours a day on a three shift basis". Every day, new problems were encountered and solutions found, thanks also to the support of the Mapei team. An extremely complex range of activities, which also involved **Mario Botta**, the architect in charge of operations: "without a shadow of a doubt, it was an exceptional site…..with, quite frankly, extremely difficult working conditions….and complex technical-functional situations which required the presence of a vast array of craftsmen and experts whose combined effort was quite out of the ordinary. Craftsmen and technicians who performed in the most extraordinary way, working on the same wave-length as a team, confronting the challenge in a way that left no margin for improvisation or for error. I would like to finish off by pointing out the symbolic value of the theatre. Putting ones hands on a city's symbol, even for the most experienced architect, inevitably leads to a number of sleepless nights". And Mapei's team also had more than a few sleepless nights, well aware of the fact that art is worth a hard day's work. Today, the scintillating music pours out of the Scala yet again, limpid like the waters of a sparkling river.

We would like to express most sincere thanks to the Botta Studio of Architecture for supplying the project drawings. Photographs by Gianni Dal Magro.

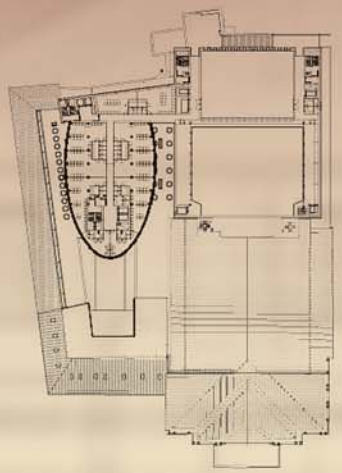
Technology and Materials

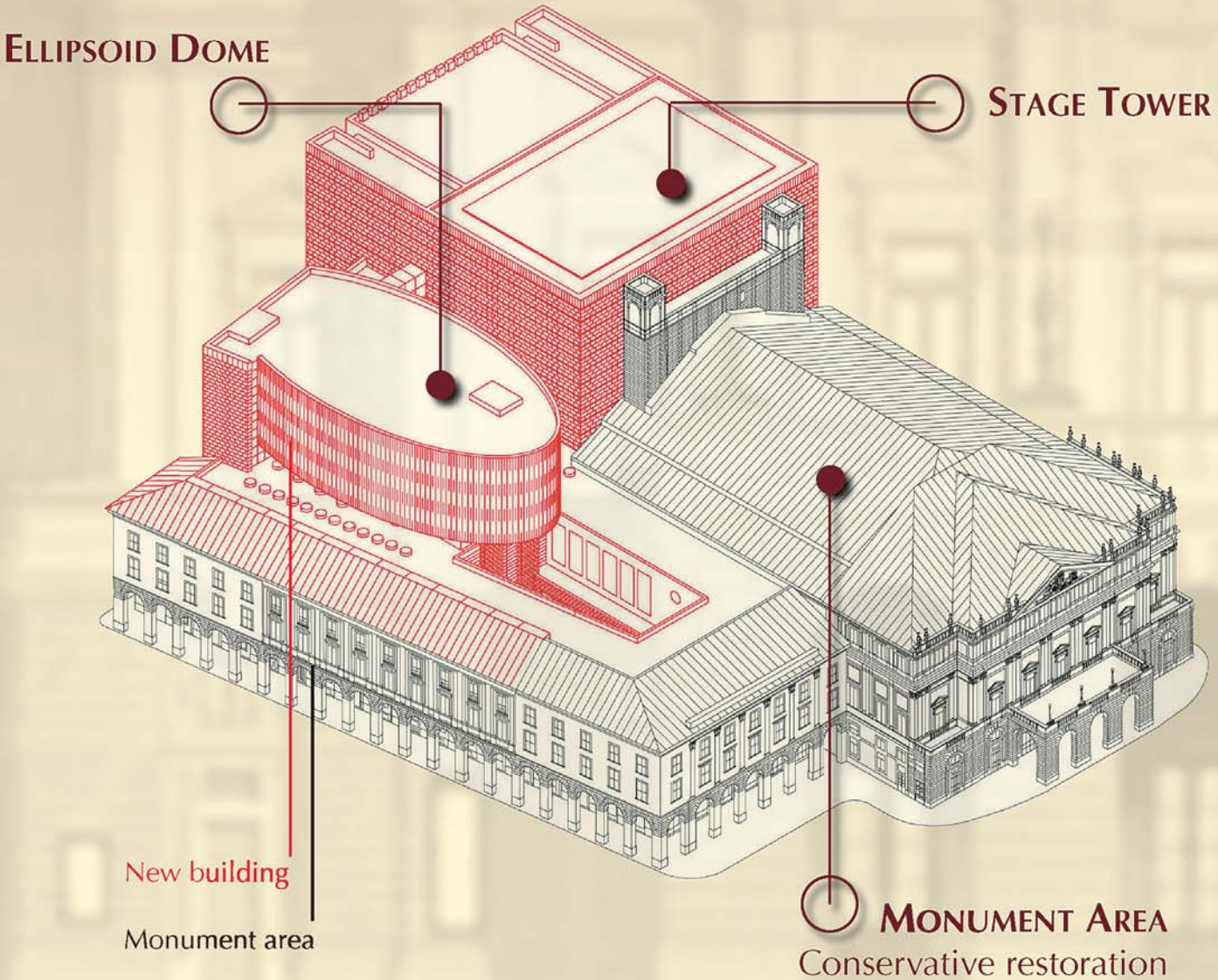
In rebuilding and upgrading the Teatro alla Scala, Technology meets Music. Mapei has contributed with their systems, innovative products and expert assistance, which represent the fruit of their commitment to research and innovation.

The presence of Mapei on the "Teatro alla Scala" site was divided into three areas of activity:

- diagnosis of the materials, taking and analysing samples of plaster, render and gold-leaf frieze decors, in order to identify the most suitable type of renovation work;
- on-going technical assistance during the work, to recommend the most suitable technical solutions to solve the various on-site problems;
- technical support regarding the use and correct application of the products during the various application and installation phases.

Approximately 40 Mapei solutions were employed on this prestigious site: from the range of systems for the building industry, to those used for constructing screeds, self-levelling products and smoothing compounds; various types of adhesive for laying ceramics, natural stone, terracotta, PVC and wood, up to systems for protecting the decorative finishes on the walls and epoxy resin systems for floors.



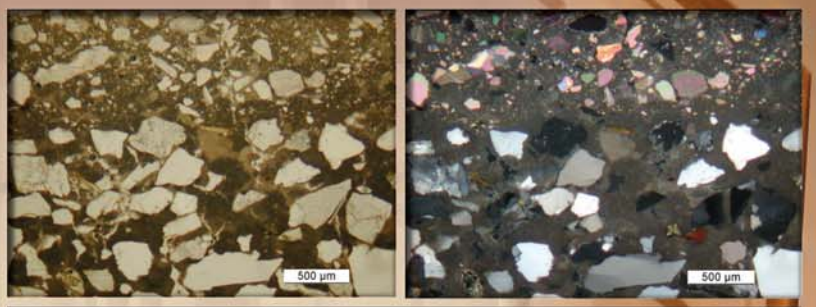


The complex nature of the renovation and restoration work of the Teatro alla Scala, and the large number of people, companies and institutions involved, meant that for the first time the editorial team of the "Realtà Mapei" company journal was unable to produce the usual Technical Data sheet.

In the following pages, and for each single area of intervention, the various types of operation performed by Mapei and the products used in each case are highlighted. Recommended reading is the marvellous volume published by Marsilio, along with the contribution of Mapei, entitled "The new Scala - the site, restoration work and architecture", which covers all technical and in-depth descriptive issues regarding this grandiose operation.

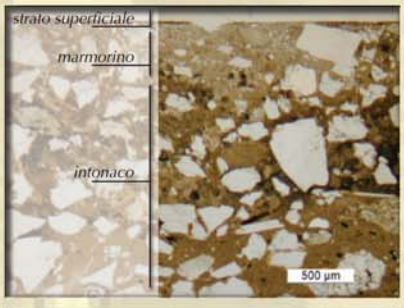
The volume is on sale in all the most important Italian bookshops.

Diagnostic work

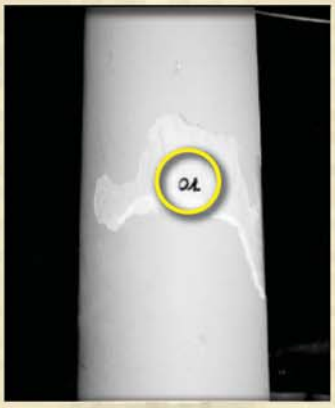


The sectional radiographic analysis of the plaster and of the underlying layer of render, observed at 1 Nicol, shows how the interface between the plaster (on the left) and the render (on the right) is indicated by the different grain size of the aggregates (larger in the render) and by the different colour of the matrix.
In the second section, observed at 2 Nicols, the interface between the plaster and the render is indicated by the variation in the nature of the aggregates, which are mainly carbonated (calcites) in the plaster and silicates in the render (quartz).

The main objective of the Conservative Renovation of the Teatro alla Scala's existing building, which derives from the original Theatre designed by Giuseppe Piermarini, and subsequently modified over the course of its two centuries of history to bring it up to required standards due to normal usage, was to leave the theatre's original spaces intact from a characteristic point of view, while also conserving their most recent layers wherever they were considered to be of value and did not markedly clash with the original design by Piermarini.
In order to reach this objective, therefore, it was initially necessary to gather all the information possible regarding its history and the materials and construction techniques used, by using a "critical relief" process which would later be used to orientate the conservative renovation operation. A fundamental step during this phase was the series of chemical-physical analyses carried out in the Central Analysis Laboratory, one of the "pride and joys" of Mapei, the real driving force behind the Research and Development activities of our Company. The laboratory is equipped with the most sophisticated and innovative equipment available, which makes it one of the most advanced Research Centres in the world, and is constantly at the service of our clientele to solve the most complex problems in the sector involving the restoration of historical monuments. Particularly noteworthy is the support activity during the Conservative Restoration work on the Walls of Jericho, the vaulted roof in the Basilica of San Francesco at Assisi and, more recently, the renovation work carried out on the Oratorio della Passione in the Basilica of Sant'Ambrogio in Milan. In the particular case of the Conservative Restoration work carried out on the Teatro alla Scala, and the gathering of important information about the materials and construction techniques regarding the stratification which took place over the course of two centuries of history of the Theatre, the following were considered:
- the analysis of the stratification of the floors in the boxes area, which helped define the materials and technology required to recover the original flooring in terracotta tiles, the last remaining reminder of the material chosen by Piermarini;
- a survey of the finishes and renders used on the walls of the corridors and boxes, which helped to determine the nature of the most recent and poorer quality dressing materials, and thus to define the most suitable techniques to remove them and to uncover the precious plaster renders previously described in 1865 in the book "A guide for the visitor to that grandiose, theatrical building";
- an analysis of the gold-leaf on the decorative elements around the boxes, which led to them being dated and, thus, to distinguish between the most antique ones from the more recent repaired areas, to help in choosing the most suitable conservative restoration techniques.



Sectional radiographic analysis of sample 1-01 (IN): the notes to the side indicate the 3 layers (surface layer, plaster and render) which make up the sample. This image allows the particle size and form of the aggregates which make up the render and plaster to be assessed, as well as the thickness of the layers.



Position of where sample 1-01 was taken.

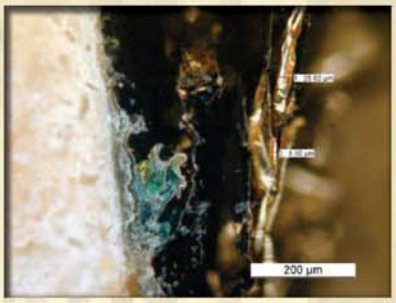
Sample 19 was taken in a point where the decorations were probably the original ones from the start of the 19th century.

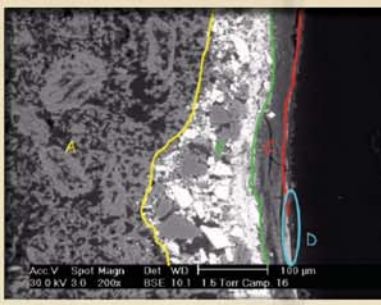
The sample of a fragment of surface gold-leaf showed that there was also an older layer.

In particular, thanks to the application of sophisticated analysis techniques, such as with an environmental scansion electron microscope (ESEM-FEG), spectrophotometry and thermogravimetric analysis together with differential scansion calorimetry (TG-DSC), it was possible to identify the nature of the levelling layers applied on top of the original terracotta tiles, together with the more recent layer of linoleum floor covering. The analyses highlighted the presence of two distinctively different levelling layers, the upper one with a base of Portland cement and the lower one, in contact with the terracotta tiles, with a base of gypsum. The results of the analyses permitted the best technique for removing these layers to be defined, with the most suitable option being to mechanically remove the cementitious-based materials, due to their being more rigid and compact, and a light chemical treatment to eliminate the mechanically weaker layer made up of gypsum-based smoothing compound, and to avoid damaging the existing terracotta. Also, the analysis of the dressings materials on the walls in the corridors leading to the boxes allowed the type of paintwork used in more recent times to be identified, and was found to be made up basically of acrylic-based paint. Similarly, the analysis in this case permitted the best technique for removing this low-quality dressing to be suggested, based on a light chemical "swab" technique to avoid altering the underlying, antique plaster render, which dates back to the end of the 19th century. The analysis also showed that the render was made up of a roughing base layer on which a plaster render had been laid using an aerated lime-based product. The presence of this binder was confirmed in the area where the plaster had a typical waxy finish which, by stopping air entering, partially impeded the carbonation process, which also demonstrated the presence of the calcium hydroxide used as the original binder.

The information deduced regarding the nature of the binders, powders and other aggregates used, supplied useful indications for the restoration team in order to define the composition of the mixes to use for renewing the render in those areas where the structure was severely compromised.

Finally, the survey was used to gather detailed information on the gold-leaf decoration of the boxes.

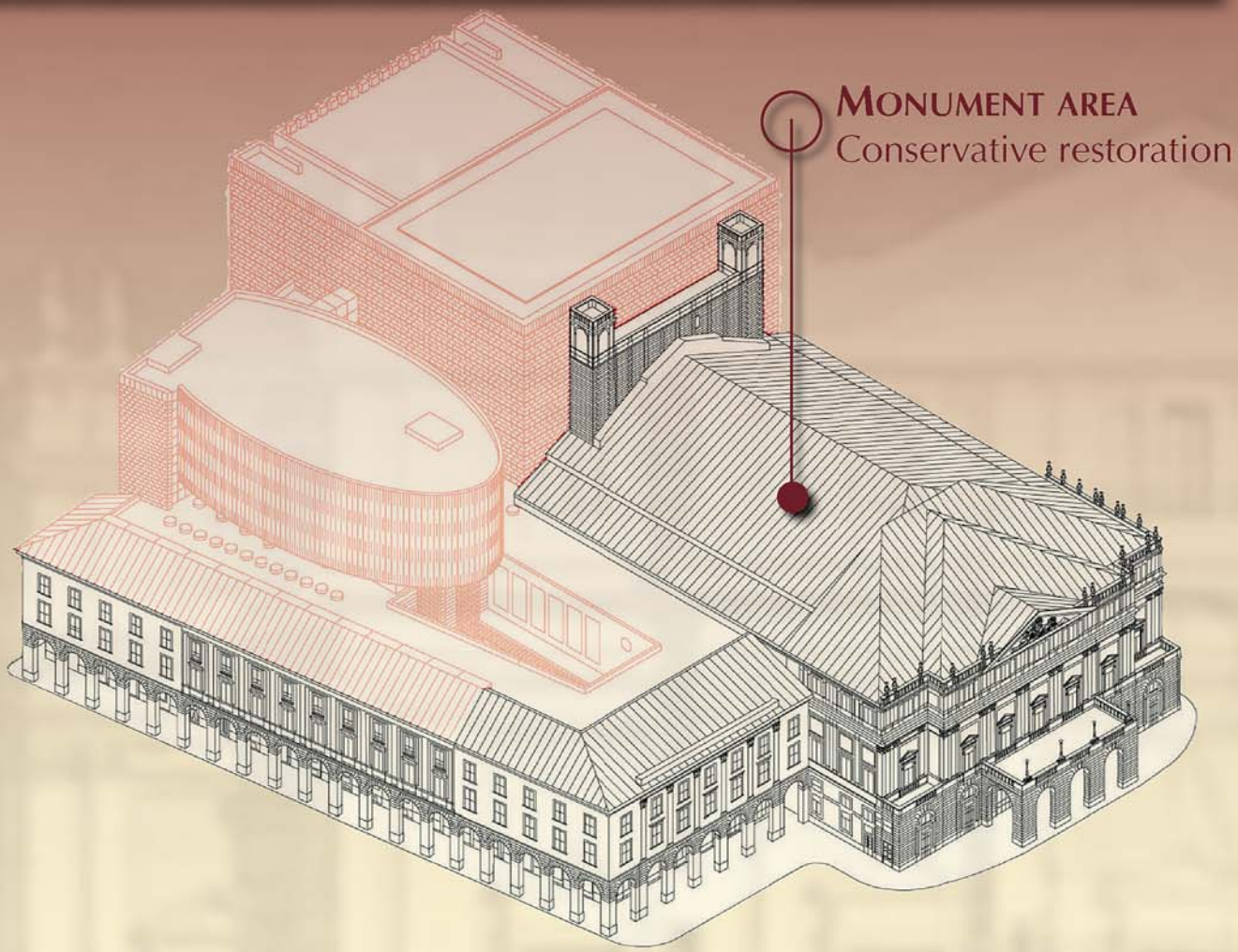




A basic chemical analysis of the various layers was carried out using an electron microscope, with the corresponding EDS images obtained in the Mapei R&D laboratory.

The sectional radiography analysis led to establishing that the most antique and, most likely, the original gold-leaf was carried out using pure gold or using an iron/copper alloy. On the other hand, the most recent repairs were carried out using copper/zinc alloys (brass). Also, the quality of the gold leafing was characterised according to whether the model on which it was applied was one of the original ones from 1830 in papier-maché, or one dating back to a more recent, post-war rebuild based basically on gypsum mouldings. Similarly in this case, the chemical-physical analysis demonstrated that it was of fundamental importance to define the most suitable technique to bring the decorations back to their original splendour.

MONUMENT AREA



CONSOLIDATION AND RESTORATION OF THE VAULTED CEILINGS
Consolidation of the brickwork of the vaulted ceilings by injecting EPOJET LV, a two-component epoxy resin with very low viscosity, and repair of the render using MAPE-ANTIQUE MC, a pre-packed, cement-free dehumidifying mortar.

CONSERVATIVE RESTORATION OF THE FLOORS IN VENETIAN-STYLE INLAY
Laying of a part of the flooring in Venetian-style inlay, ruined when the theatre was renovated on previous occasions, using binder (STABILCEM SCC) and self-levelling smoothing compound (ULTRAPLAN MAXI) with high dimensional stability properties.

INSTALLATION OF THE SUBSTRATES, THE GALLERY, THE FOYER AND THE STALLS
Preparation of the areas to be laid by installing screeds made using TOPCEM and TOPCEM PRONTO. Correction of the slopes and elimination of differences in the level of the areas to be laid, using FIBERPLAN, a self-levelling fibre reinforced smoothing compound, and STABILCEM controlled-shrinkage binder for cementitious mortar.

CONSERVATIVE MAINTENANCE OF THE EXISTING TERRACOTTA FLOORS AND LAYING OF THE NEW ONES
The surface of the existing terracotta floors, which had inevitably been ruined by normal use over the years, were brought back to their original splendour by a thorough cleaning process using KERANET. The new terracotta flooring was laid using KERAFLEX high-performance adhesive.

In the monument area in particular, removal of the surface layers of the paintwork in the corridors leading to the boxes, which, after careful analysis, was found to be acrylic-based, was carried out using PULICOL, specially modified in this case to cater for both the poorly-ventilated work environment in which it was used, and to render it sufficiently thixotropic.
The skimming layers which had been applied over the original terracotta tiles, on the other hand, were removed both mechanically and with the use of KERANET, an acid-based product which is particularly suitable for removing traces of cement, lime, efflorescence, residues of cementitious adhesives and grouts. In the areas where the original terracotta tiles were irreparably damaged, new ones were laid using KERAFLEX, a high-performance adhesive which is classified as C2TE according to Standard EN 12004.

In the corridors leading to the boxes, it was also necessary to carry out static consolidation of the arched, brickwork ceilings by injecting EPOJET LV, a low-viscosity epoxy resin. The vaulted ceilings were then rendered using MAPE-ANTIQUE MC pre-packed cement-free mortar. A further operation was carried out in the corridors leading to the boxes, using STABILCEM SCC binder and ULTRAPLAN MAXI self-levelling smoothing compound to repair areas of the Venetian-style floors and to perfectly blend in the original areas with the new, repaired areas. In the foyer, gallery and stalls areas, before laying new parquet flooring, quick-drying screeds with high dimensional stability were installed, using TOPCEM binder and TOPCEM PRONTO pre-blended mortar. Also, where required, the use of FIBERPLAN self-levelling smoothing compound reinforced with polymeric fibres was recommended for correcting the slope of the areas to be laid, in order to reduce the risk of cracking to a minimum.

For this final operation, STABILCEM binder was also used which, mixed with continuously-graded aggregates, helped in the preparation of controlled-shrinkage self-levelling mortar.

ELLIPSOID DOME

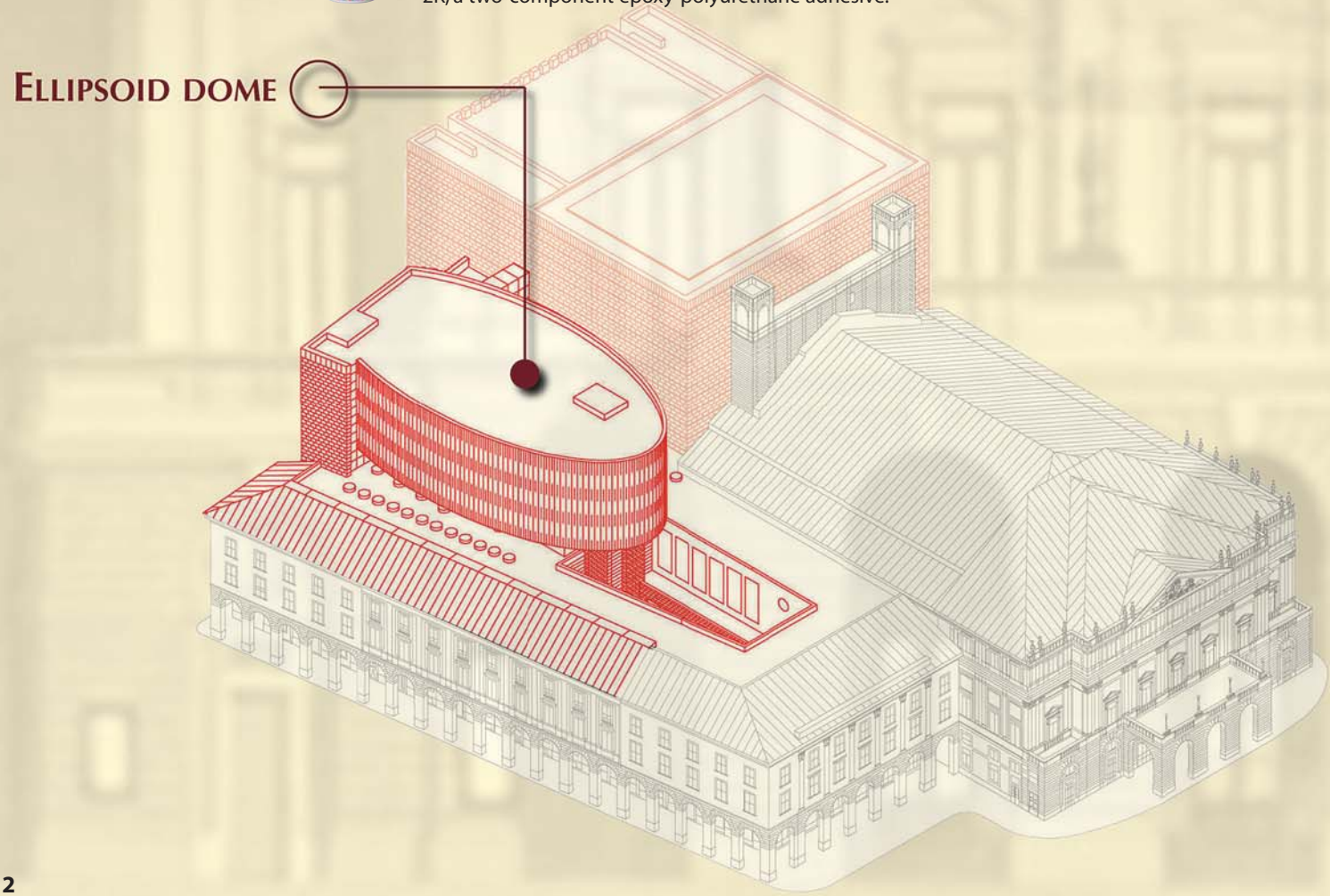
BINDERS AND PRE-BLENDED MORTAR FOR SCREEDS
Installation of screeds in all the areas, including the canteen and washrooms, using TOPCEM and TOPCEM PRONTO.

WATERPROOFING SYSTEMS
Waterproofing of the showers and canteen using MAPELASTIC and IDROSILEX PRONTO.

ADHESIVE AND GROUT FOR LAYING CERAMIC FLOORS
Laying of porcelain and klinker floors and decorative dressing using KERAFLEX MAXI high performance cementitious adhesive and KERACOLOR FF cementitious grout for joints.

ADHESIVES FOR LAYING STONE FLOORS
Laying of Botticino di Cava marble using GRANIRAPID, a fast-setting and hydration adhesive.

LAYING OF PARQUET
Laying of floors using pre-finished wooden slats in the office complex and corridors, using ULTRABOND P902 2K, a two-component epoxy-polyurethane adhesive.



When the new structures of the ellipsoid dome and the stage tower were constructed (designed by the architect Mario Botta), the quality of the conglomerate employed for the foundations and restraining walls proved to be of particular importance. In this phase, Mapei offered their experience to the building company and the concrete manufacturer involved, to optimise the composition of the cement conglomerate. The concrete, prepared using nanostructure admixes from the DYNAMON range, was the solution chosen to meet the customer's requirements regarding waterproofing, durability and the low amount of heat generated.

Mapei's support was also important in the sector involving the finishing of internal surfaces, recommending the most suitable system for waterproofing the canteen and showers by using rigid and flexible protection products (IDROSILEX PRONTO and MAPELASTIC), and also the most suitable adhesives for the various types of floor coverings laid in the ellipsoid dome. High performance, flexible adhesives were used (KERAFLEX MAXI, class C2TE according to Standard EN 12004) for laying the porcelain and klinker floors.

To avoid the onset of both warping and staining, a quick-setting and hydration adhesive (GRANIRAPID, class C2F according to Standard EN 12004) was used for laying the slabs of Botticino marble. Finally, to make sure that the wooden slats were laid correctly and securely, ULTRABOND P902 2K proved to be the most suitable choice.

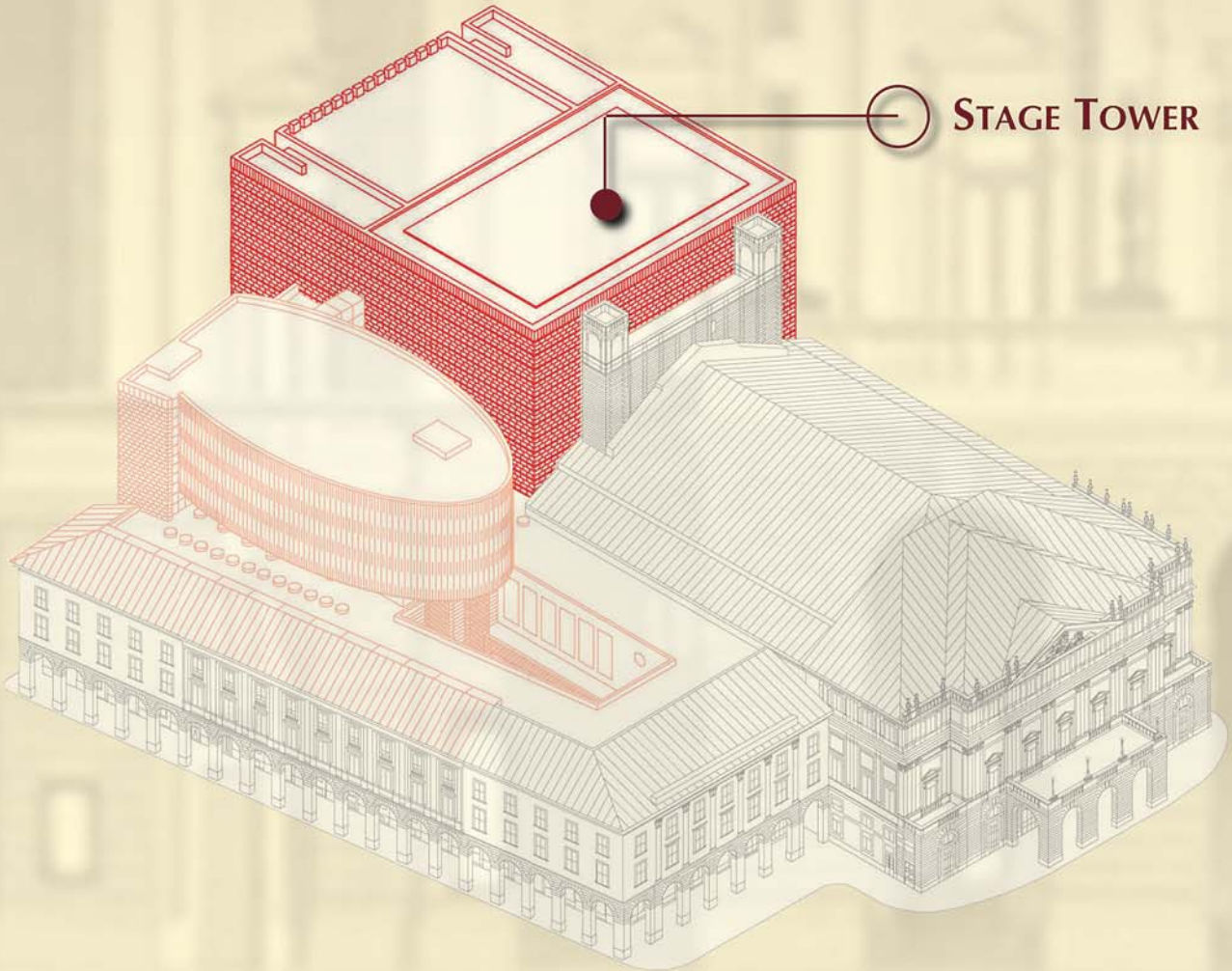
STAGE TOWER

BINDERS AND PRE-BLENDED MORTAR FOR SCREEDS
Installation of screeds in the rehearsal rooms for the dance troupe and for the orchestra using TOPCEM and TOPCEM PRONTO.

LAYING OF KLINKER TILES
The klinker tiles in the technical services areas were laid using KERAFLEX MAXI and grouted with KERACOLOR FF.

RESIN FLOOR FINISHES
The finishing coat of the floors in the service corridors and walkways were carried out using the solvent-free, multi-layer epoxy system MAPEFLOOR SYSTEM 31 (including PRIMER SN, 0.5 QUARTZ and MAPEFLOOR I 300 SL).

LAYING OF PVC FLOORS
The sheets for the PVC flooring in the rehearsal room were bonded in place using ADESILEX V4, an universal acrylic adhesive in water dispersion.



In the Stage Tower area, apart from installing the screeds with the same materials and techniques as those used in the monument area, and laying the klinker floor tiles by using KERAFLEX MAXI (KERACOLOR FF was used for grouting the joints), Mapei's assistance was also required to define the materials and operational techniques for the service corridors and walkways. In these areas, to obtain a floor covering which was particularly resistant to abrasion caused by the rigours of the service loads, the best solution was found to be the solvent-free, multi-layer epoxy system MAPEFLOOR SYSTEM 31.
Finally, in the rehearsal rooms, where PVC sheets were to be used, an universal acrylic adhesive in water dispersion, ADESILEX V4, was employed, to guarantee the functionality of the floor throughout its entire period in service. RM

Mapesil AC

Solvent-free, acetic-crosslinking mildew resistant silicone sealant.

As well as being useful for DIY, MAPESIL AC is also a highly professional silicone sealant.
MAPESIL AC is a single-component solvent-free acetic-crosslinking mildew-resistant silicone sealant, available in 26 colours and transparent. Ideal for sealing glass, ceramics and anodised aluminium, after first applying PRIMER FD, it can also be used on concrete, wood, metal, painted surfaces and rubber.
It is used for sealing expansion joints of +- 20% expansion of their initial size or to form perfectly elastic gaskets between different elements used in building, mechanical engineering, ship-building, car manufacturing, etc.
In the building industry it is generally used for sealing joints in wall and floor coverings of ceramics and cement, provided they are not subject to heavy abrasion, or else for sealing joints between sinks or sanitary ware and ceramic tiles in kitchens, bathrooms and showers with colours coordinated with the grouts. It is also ideal for sealing expansion joints in swimming pools and for sealing glass tiles and windows, air ducts and water pipes, portholes and even glazed frames. It can be used for assembling glass tiles and constructing artistic stained glass windows.

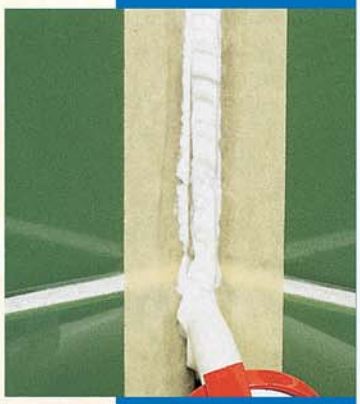
Cutting the nozzle according to the size of the joints.

Application of Primer FD.

Technical Characteristics

MAPESIL AC is prepared as an elastic thixotropic paste and is easy to apply onto both horizontal and vertical surfaces. It cross-links at normal temperatures, it is highly durable and extremely elastic. It bonds perfectly to glass, ceramics and anodised aluminium.
It is also mildew resistant, waterproof, permeable to vapour, resistant to chemical agents, easily workable, flexible up to - 40°C and resistant to temperatures of +180°C.

For further information on this product, see its technical data sheet available at the web site www.mapei.com.



Application of Mapesil AC.

Smoothing the joint with soapy water and a small brush.

Sealing a ceramic tile floor with Mapesil AC.

Sealing sanitary ware.

DYNAMON SYSTEM

The first nanostructural additives on the market.

Superplasticizers from the Dynamon range, for which Mapei holds a worldwide patent, are third-generation carboxyl polymers. These innovative additives acting on the nanostructure of cement paste may be described as nanostrucutral additives.
Thanks to exclusive DPP technology (Designed Performance Polymers), Mapei can adapt the characteristics of additives to cater for specific requirements.
The Dynamon System is actually an extremely high-tech additives system featuring specific ranges of products developed for various applications:
Dynamon SP for prefabrication purposes, Dynamon SR for standard uses, and Dynamon SX for major building work. There are all kinds of technological and economic benefits deriving from the use of nanostructural superplasticizers.
For instance, DYNAMON SP3 or DYNAMON SP4 may be used in the prefabrication sector to create extremely fluid or self-compacting concretes (SCC) with extremely low water/cement ratios, thereby reducing or even eliminating the steam maturation cycle. Optimising or eliminating the heat cycle allows more suitable kinetic hydration for forming higher quality hydrated crystals, thereby guaranteeing higher mechanical resistance at 28 days.
The smaller temperature difference between the manufactured item and environment during the first few hours of maturing causes less heat stress and hence surface cracks are less likely to form.
Thanks to the aforementioned benefits, more durable elements may be manufactured.
Economically speaking, using DYNAMON SP3 and DYNAMON SP4 nanostructural additives entails a series of advantages deriving from reduced energy, investments and maintenance costs for the plants.
The use of these additives for making self-compacting concrete has further advantages due to a reduction in installation times and the way vibration is eliminated.
As regards the ready-made concrete sector, the characteristics of nanostructural additives may be exploited to produce highly fluid concretes that are workable for longer periods and ensure more quickly developed mechanical resistances even in winter.
This makes it possible to reduce the amount of time involved in handling formworks and allow them to be re-used as best possible, thereby notably boosting productivity.

For further information on this product, see its technical data sheet available at the web site www.mapei.com.

NEITHER SLUMP

RESEARCH, DEVELOPMENT AND INTE

We interview Giorgio Squinzi.

On 24th January, 2005 Mapei Americas inaugurated their fourteenth manufacturing plant. They opened it at San Bernardino, in California (USA).

The international growth of the group is constant. New markets are being opened up and existing ones are being consolidated.

Italy is currently going through a period of financial difficulties and new methods and ideas are needed to rapidly recover from this serious slump. Economists, businessmen and politicians are trying to understand and interpret what is happening and, at the same time, suggest methods and models that may serve as examples for the whole national economic system. Many of the major Italian media have been talking about Mapei over the past few days and have tried to understand the reasons for their growing international success. It is a success that is now perceived as bucking the trend, when looked at from the point of view of the current economic outlook and it is for this reason that it is analysed and put forward as an example to be imitated.

In a recent interview published in the Italian daily newspaper, Corriere della Sera, on May 25th , Giorgio Squinzi, quoting hard figures, underlined this positive trend: "Over the past 10 years, the Mapei Group has grown at an average rate of 20% per year. At the beginning of 2004 we set ourselves the target of achieving a consolidated income of 2 billion by 2010, meaning an increase of 14-15% per year. Last year we closed with 1,073 billion, an increase of 14.7% over 2003, as well as net profits of 50 million, and the beginning of 2005 looks promising too."

On more than one occasion Giorgio Squinzi has repeated the reasons for the excellent perfor-

The picture shows the 14 plants operating in the Americas, as well as the Mapei USA headquarters at Deerfield Beach, Florida.

NOR RECESSION

RNATIONALISATION: THE MAPEI WAY

mance achieved by the Mapei Group in Italy and throughout the world: specialisation, research and development, and internationalisation.
Giorgio Squinzi has firm ideas on what internationalisation means: "It doesn't mean exporting or delocalising, but winning shares of foreign markets. We have 43 plants in 21 countries, 7 in Italy. In the coming months we are going to open three in China."
In this sense, following a line that is consistent with the philosophy of our Group, we are opening this issue of "Realtà Mapei" with the very recent agreement between Mapei and CNR (National Research Council): this leads to a new approach which, if followed by other Italian companies, could benefit the whole Italian economy.
The following pages give a full report on the opening of the new, ultra-modern Mapei plant at San Bernardino in the United States.
Two important events that underline how "research" and "internationalisation" are not just abstract concepts for Mapei, but real tools to be used to build their business and growth.

It was precisely with the idea of getting a real grip on the reasons for the Group's internationalisation and the meaning of it that we put a number questions to Mr. Squinzi regarding the recent opening of the Mapei plant in the United States.
Analysing a practical case may in fact help to understand the methods Mapei are using and the targets they wish to achieve, quite apart from broader considerations of a more general nature.

Mr Squinzi, Mapei has opened a new plant in the United States. What led you to do this?

Mapei's North American operations as a whole account for a third of our business worldwide.
It is an extremely important market and is closely linked to our parent company. Our first manufacturing plants outside Italy were in fact opened in Canada - at Montreal, in 1978 - and in the United States - at Phoenix, in 1983.

Why did you decide to build a plant at San Bernardino, in California?

There are two reasons. One is that, with the plant we have just opened at San Bernardino, we have completed a cycle of territorial coverage of North America.
The second is that this plant, which is strategically very important for Mapei, is designed to be expanded in the near future.

Can you tell us the results you expect from this market?

The North American market has given us a great deal of satisfaction over recent years and, for our industry, is constantly growing. In the medium to long-range period, and in line with the Mapei Group's strategy for global growth, we expect to continue our investments in this geographical area where we are already an important force.

From the left: Marco Squinzi, Simona Giorgetta and Veronica Squinzi at the tape-cutting ceremony.

Are there other spheres which Mapei intends to expand in America?

Besides investing in manufacturing plants like this one at San Bernardino, we are continuing to invest in other fields which are secondary, but very important for us, to make Mapei Americas ever more competitive. I refer to the sums we have set aside to fund research and development, marketing, training and to strengthen our sales network.

Did you feel anything special at the inauguration of this new plant at San Bernardino?

Yes, for me this inauguration had a very special symbolic meaning. The tape was cut by three members of the third generation of the Squinzi family: by my children Veronica and Marco and by my niece Simona Giorgetta.
So the ceremony did not just stress how important this new manufacturing unit is for all of us, but above all it was proof of how our family continues to believe in the company values that my father, the founder of Mapei, taught us.

MAPEI IN THE USA

In San Bernardino (California - USA) the 14th manufacturing facility of Mapei Americas has just opened.

Nick Di Tempora, President of Mapei Americas, is proud of the new San Bernardino plant.

Nestled at the base of the San Bernardino mountains in California, the 14th manufacturing facility of Mapei Americas has just opened, making Mapei the largest manufacturer of tile and floor-covering adhesives in the Americas.

Nick Di Tempora, President of Mapei Americas, shares with us his long-range view on the California expansion and its effects on Mapei's customers.

Why did Mapei decided to build a plant in California?

The main reason we chose California as the site of our latest expansion was to enable us to better serve the largest single state in terms of potential for tile adhesives sales. Between California and Florida, these two states represent 40% of all ceramic tile sales in the United States. We expect a 40% increase in sales over the next 18 months as a result of our new plant in San Bernardino.

Secondly, for the past 17 years we had been servicing California customers from our full-stocking warehouse in Anaheim (Los Angeles), which was supplied from our plant in Phoenix, Arizona. Due to the quality of the raw materials, 60% of the sand used in the Phoenix plant had to be trucked in from California. Then, 60% of the products produced in Arizona had to be trucked back to California. Ideally, we should have a plant within 300 to 350 miles of our customers. Otherwise, as you can see, shipping becomes a burden.

Why was San Bernardino selected as the site for this new manufacturing plant?

We could possibly still service the San Diego area from the Phoenix plant, but we are better able to serve Los Angeles and the areas north and east of it from our San Bernardino location. We certainly expect the future growth of California to be in that direction. We have discontinued service from our Anaheim warehouse, because from San Bernardino we are well able to provide products to our distributors, who then supply their customers in the Los Angeles area.

Did raw materials resources and transportation convenience play a role in your choice of San Bernardino?

Yes, San Bernardino provides a happy medium in both those respects. Our raw materials sources are closer to San Bernardino than to Phoenix; and U.S. Highway 15 runs from San Diego to Utah, which allows us to ship products easily to Las Vegas and even Salt Lake City.

In total, we will serve California, Nevada, Utah, Southern Idaho and parts of Colorado and Wyoming.

The city of San Bernardino has been very flexible in working with us and providing assistance to help us move as quickly as possible to begin manufacturing here. Mayor Judith Valles first met Mapei through our cycling team four or five years ago. After inviting all the team members to her office to learn more about the men who wore the colorful uniforms of Team Mapei, her interest was piqued upon learning that we were thinking about building in Southern California. She has been behind our efforts from the very first; and the members of her Economic Development Council have worked tirelessly with us and with our architect, Raffaele Greco, to bring this project to the point of this grand opening.

What are your growthplans for the San Bernardino location?

We have purchased 17 acres of land on this site. The first phase, which we

"Delivery time for West Coast clients has been cut nearly in half."

Nick Di Tempora, President of Mapei Americas

have just completed, covers approximately 120,000 square feet. Within five years we will build a second 100,000 square feet. The final phase, another 100,000 square feet, should be complete within about eight years.

What other activities besides manufacturing will take place at this plant?

Within the San Bernardino facility, as in all Mapei manufacturing plants, we operate a stringent Quality Control Laboratory, which checks manufactured products as well as raw materials to ensure that they meet our high quality standards.

At the San Bernardino plant, we have also established a Technical Services training room to provide a meeting place to hold seminars for our distributors and contractors. It has always been Mapei's philosophy to provide continuous training for the flooring installation trades. We feel this is the only way to keep our industry growing and to deliver the best possible flooring installations.

How have customers been responding to being served from the San Bernardino plant?

The feedback has been very positive so far. Customers are delighted that their delivery time has been cut nearly in half!

Man of the Year: Nicholas Di Tempora

This year, as we celebrate the 60th Anniversary of Boys' Town of Italy, the oldest American charity working abroad, Nicholas Di Tempora, the President of MAPEI Americas, is being honoured as the Boys' Towns Man of the Year.

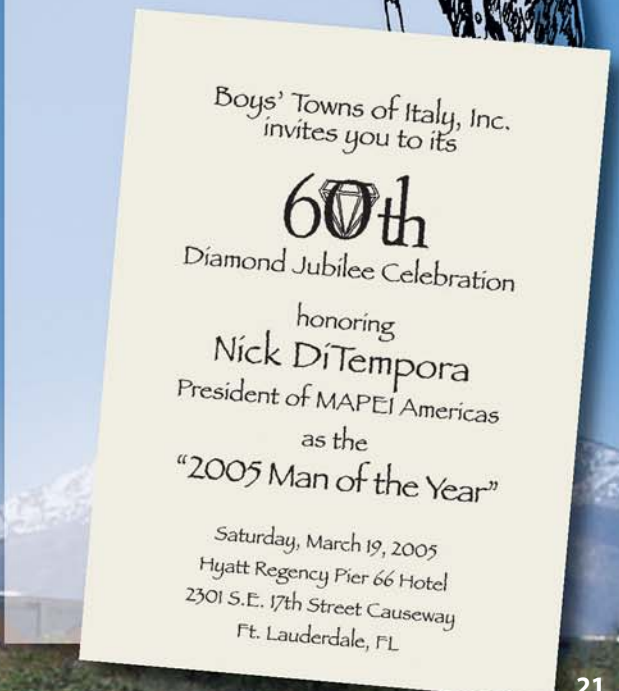
Sixty year ago, a young Irish priest accepted the challenge of saving children from the ravages of World War II in Italy. Monsignor John Patrick Carroll-Abbing began by providing a refuge for the street children in a cellar near the railway station.

In 1945 this meagre shelter was replaced with the first Boys' Town of Italy, located in Civitavecchia, 45 miles northwest of Rome. Over the years, the Monsignor built a total of eight boys' towns and one girls' town.

Nick also felt the stricture of the final years of World War II. In 1951, his parents immigrated with Nick and his sister to Montreal, Quebec. Through hard work, Nick turned his young life into a success story measured by accomplishments first in the field of real estate and more recently in the construction industry trough his career in Mapei.

Nick feels strongly for the youth who have found safety and security in the Boys' Towns of Italy. In his words, "Children do not ask to be brought in the world. When they arrive, they should be given every chance to learn about love and caring so they can develop into the best individuals they can be."

Nick sees Boys' Town of Italy as a way to give children that opportunity.



Solid Civic Partnerships Celebrated at Grand Opening

The Mayor and her Economic Development Council have been strong supporters of Mapei's efforts.

Thinking globally and acting locally is a key tenet of Mapei's corporate culture. As CEO Mr Giorgio Squinzi puts it, "We are Mapei, but in Italy we are Italian, in Canada we are Canadian, in the United States we are American, and in California we are Californian."

This philosophy was aptly reflected in the opening of the company's newest plant. San Bernardino Mayor Judith Valles joined Mr. Squinzi and Mapei Americas President Nick Di Tempora in opening the "World of Mapei" to Southern California with speeches, a ribbon-cutting ceremony and a tour of the plant.

Mayor Valles recalled, "I first learned about Mapei four or five years ago when the Mapei Americas cycling team competed in an event here in San Bernardino." The Mayor and her Economic Development Council have been strong supporters of Mapei's efforts to get the new plant up and running as quickly as possible.

The work did not proceed without challenges, however. At one point, the design had to be substantially changed because the silos had to be shortened and enclosed inside a housing tomeet California's tough environmental standards.

At the opening, Governor Schwarzenegger sent his representative, District Director Larry Grable, to thank Mapei for contributing to the economic expansion of the state and for crea-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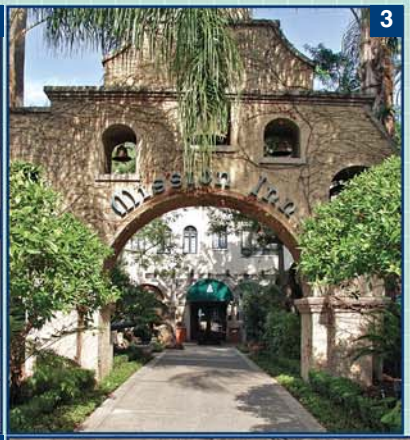
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Photo 1.
Luncheon at the Historic Mission Inn

Photo 2.
Mayor Judith Valles greets attendees at the grand opening.

Photo 3.
Historic Mission Inn in Riverside, California.

Photo 4.
Larry Grable (center), from the governor's office, congratulates Mr. Squinzi (left) and Mr. Di Tempora (right) on the opening of the San Bernardino plant.

Photo 5.
From the left on: Guido Trussardi, Luciano Trussardi, CEO Giorgio Squinzi, Mayor Judith Valles and Architect Raffaele Greco enjoy the tour.

ting new jobs in the San Bernardino area. The first phase of the plant, which opened in January, employs 32 local residents. More will join the staff with the expansions that are planned in the coming years.

Because Mapei uses local resources whenever possible, the plant has added to the economies of a number of raw materials suppliers in Southern California. Representatives from Apex, Cemex, JR Simplot, Lehigh, White Cement, Oglebay, Norton, Omya and Porter Warner came to the opening ceremony, took the plant tour and joined Mapei for lunch at the Historic Mission Inn in nearby Riverside, California.

Mapei powdered adhesives, mortars and grouts – like those used at the San Diego airport (see article on page 30) – will be among the first products produced at the San Bernardino plant. West Coast contractors who attended the grand opening agreed that these products, which are formulated for the requirements of their geographic region, will give them faster turnaround time on their projects due to speedier deliveries.

While it is exciting to contribute to the present economy of the area, Mapei also feels a responsibility to the future of the people of San Bernardino. Because of Mapei's strong belief in education, the company made a contribution to the children's department of the San Bernardino Public Library.

As he gave the check to head librarian Ophelia Roop, Nick Di Tempora announced that Mapei will work to develop a continuing relationship with the library throughout the coming years.

"Today, we feel that we have truly become a part of the community of San Bernardino," said Mr. Di Tempora, "and we hope that San Bernardino knows that they are now an important part of the world of Mapei."

Donation to the San Bernardino Public Library

With the opening of the San Bernardino plant, Mapei established itself as a member of the community and a good corporate citizen.

Cutbacks in state government funding have hit public libraries hard in Southern California. The Children's Department at the San Bernardino Public Library has been unable to purchase new books for two years. Library Director Ophelia Roop put out a plea for community support on the library's website, and now Mapei is lending a helping hand.

At the luncheon to celebrate Mapei's grand opening for the new San Bernardino Plant, Nick Di Tempora handed Mrs. Roop a check for $2,500 to start things rolling. "We believe that our future depends on the children and children need a strong educational background," said Di Tempora, "We hope to establish an ongoing partnership with the library through our presence in the San Bernardino area".

Mrs. Roop accepted the check, with sincere thanks to Mapei for its contribution to today's children and to the future of San Bernardino.

Above: the library is a strong asset of the San Bernardino community.

Right: Nick Di Tempora with Library Director Ophelia Roop on the grand opening of the San Bernardino plant.

Walking the Production Line


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Mapei vendors, distributors, contractors and other customers joined in the celebration at the San Bernardino plant on January, 24. A major attraction was the opportunity to see a manufacturing facility in operation. San Bernardino unit manager Jose Granillo, whose career includes operations in the food processing industry, proudly led the way through a spotless plant. In addition to the bag-filling process and the palletizing assembly, guests were most impressed by the 27 silos that house the different raw materials used to produce Mapei "powders."

Mike Moore, Mapei's Engineering Manager, described the process from raw materials to manufactured product: "Raw materials are received in our Quality Control Laboratory each day. There they are tested to ensure that they meet Mapei's strict standards. Approved raw materials, such as sand, cement and polymers, are then transferred into the large silos that feed into the mixing and filling equipment.

Mapei's processes are highly automated, and the mixing is orchestrated from the highly computerized Production Control Room. As each bag is filled, it moves onto a conveyor belt, where it is sealed, weighed, marked and moved to the palletizer. The palletizing equipment stacks a predetermined number of bags to the right height and shape, then bundles them in a plasticized over-wrap. From this point, a forklift moves the pallets to a holding area, where more samples are taken for further Quality Control testing. Approved products are then moved into the warehouse and stored for future shipments.

The San Bernardino warehouse also stores Mapei's line of installation tools and accessories, as well as products manufactured at other sites and transshipped to this location for local delivery. Guests at the grand opening were able to see all facets of production in action. They also got a look at the first two bags of product that came off the assembly line. RM


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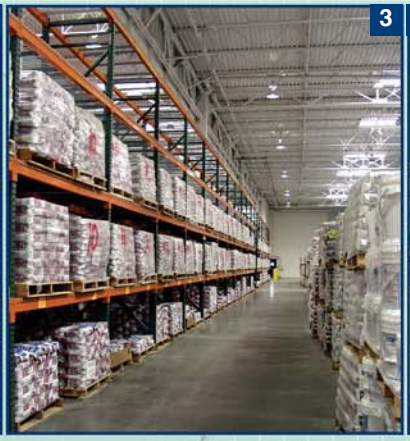
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Photo 1.
Guests tour the plant to see a manufacturing facility in operation.

Photo 2.
The families of Mapei's employees also toured the plant.

Photo 3.
After Mapei products are manufactured, they are stored in the large warehouse space.

Photo 4.
The first two bags of product manufactured at the San Bernardino plant.

Plant's Architecture Reflects the Environment

by Raffaele Greco

TWO AWARDS FOR MAPEI

Mapei's new plant in San Bernardino won two important awards: the "New Construction Award" and the "Design & Building Award", both granted by the San Bernardino Area Chamber of Commerce. The former was accepted by Jose Granillo, unit manager, whereas the latter went to the Greco Design & Construction Inc. Raffaele Greco, the appointed architect for the building of the plant, has extensive experience in selecting sites for construction, developing and planning, engineering and construction of projects throughout South Florida, where he has been a resident for over twenty years. He has specialized in large scale design and development projects, including commerce centres and industrial parks, shopping centres, high-rise and low-rise office buildings, luxury hotels, apartments and condominium complexes. His concepts have strong relationship to surroundings, clarity of design and productive use of space. His success in design and building has evolved through a deep commitment to his profession and his desire to create visionary designs for the enjoyment of patrons, employees and the general public. Local magazines, such as the quarterly "San Bernardino Business", reported the news.

In the photo: San Bernardino unit manager Jose Granillo, right, and architect Raffaele Greco receive the awards.

It is difficult, but not impossible, to explain how a hierarchy of choice has been decided for an architectural design. Stylistic and aesthetic idioms and guidelines can be adopted to construct a building in a given type of environment, and this project provides a number of examples to draw from.

Due to Mapei's great architectural awareness in constructing its image around quality building design, we were able to develop this industrial project into an icon that reflects more than the usual construction with high-tech contents wrapped in tilt-up concrete and glass surfaces. The land and the varied climate of southern California presented several opportunities to design the Mapei San Bernardino plant to reflect the inter -twined environment of desert and mountains.

The sand-and-rose colors of the exterior walls make the building appear to be growing up from the surrounding desert. The fenestrations on the east side recall the peaks of the mountains in the background. The building was designed as an extension of the topography, a technique practiced and taught by Frank Lloyd Wright.

The rotunda looks like a sculpted structure that was rolled down from the mountain beyond and stood on end in the middle of this project overlooking U.S. Highway 215. The architecture is not only a graceful group of facades but also a set of planes that share in the same compact sculptural solid. The interior structural system is made of steel with a system called "through frame." This system keeps the center as one unit under seismic movement, transferring any damages to the outside perimeter of the structure.

In order for the Mapei plant to be architecturally successful in the community, it needed to present a sense of open space. To accomplish this, the surrounding landscape is reflected – and, thus artificially duplicated – in the interior as well as on the matrix of glass panels on the exterior of the building. The reflected environmental images in the interior make the occupants more aware of their position in the relationship between the landscape and the architectural space. The design and partition of the glass panels relate the concrete structure to the ground beneath, the sky above and the human scale.

Open space systems are vital for the life of buildings. Permeable building edges, sidewalks and symbiotic open space-building relationships are simple design solutions that enliven the system as well as the site.

I feel that I, as a designer, have a pivotal role in the evolution of complex open space. My vision is to make open spaces a dynamic system for successful buildings and city life.

Lady Liberty

Mapei's products helped update the base of the Statue of Liberty in New York Harbor.

Text by Diane Choate,
photos by Carolyn Ryan, Mapei Corp.

The Statue of Liberty in New York Harbor was closed to the public in response to the terrorist attack on World Trade Center on September 11, 2001. Although Liberty Island re-opened on December 20, 2001, the Statue still remained closed due to security concerns until August 3, 2004. Meanwhile, grants totalling seven million dollars made it possible to carry out several works to improve the monument's security, including the opening of new exit ramps providing additional access for handicapped visitors. Since August 3, 2004 visitors have had access to the Statue's pedestal observation deck, promenade, museum and the 11-point star-shaped Fort Wood, the Statue's underlying structure built in 1810. The Statue's crown and torch are still not open to the public: this has caused much dissatisfaction among visitors, who are denied access to the highest point of America's most famous monument.

The Long History of the Statue of Liberty

Lady Liberty is a gift that was given by the people of France to the people of America in 1886 in recognition of the friendship established during the American Revolution. Over the years, the Statue of Liberty has grown as a symbol of freedom and democracy as well as this international friendship. In visitors' eyes it also symbolizes New York and the United States, as the statue has welcomed thousands

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Photo 1.
The Statue of Liberty raising the Liberty Torch in New York Harbor.

Photo 2.
Inside view of the Ellis Island Immigrant Processing Building, where immigrants entering New York Harbor first came ashore to start the immigration process. The island is now part of the Statue of Liberty National Park.

Photo 3.
Inside of the base of the Statue of Liberty before the restoration began.

Photo 4.
The renovation project included the building of a new handicapped-accessible exit ramp.

Photo 5.
Installation work is completed.

of immigrants and tourists upon their arrival in the USA for more than a century.
The Statue's story goes back to 1865, when the liberal intellectual Edouard René Lefebvre de Laboulaye and the sculptor Frédéric-Auguste Bartholdi of Paris decided to build a monument embodying the American ideals of political and ideological freedom and give it as a present to the fabled "Land of Opportunity". Bartholdi was commissioned to design the sculpture; and, since he required the assistance of an engineer, Alexandre Gustave Eiffel (the famous designer of the Eiffel Tower) was commissioned to design the monument's massive iron pylon and secondary skeleton framework.
The Statue was built in France and then shipped to the United States and assembled on Bedloe Island (later renamed Liberty Island). The American people were responsible for raising funds for the building of the pedestal. On October 28, 1886 the dedication of the Statue of Liberty took place in front of thousands of spectators, including U.S. President Grover Cleveland. In 1965 Ellis Island, an island in the New York Harbor facing Manhattan, was incorporated as part of the Statue of Liberty National Park. The island was the place where immigrants entering New York Harbor in the late 19th and in the 20th century first came ashore to begin the immigration process. The main building on Ellis Island is now a museum

Photo 6.
Gordon Emslie of Phillipsburg Marble sets granite tiles in the floor.

Photo 7.
Close-up of the completed ramp.

Photo 8.
Granite tiles were installed on the stairs.

Photo 9.
Robert Barron of Phillipsburg Marble stands near the completed ramp.

Photo 10.
The updated exit at the base of the Statue is now ready to welcome visitors.

dedicated to the history of immigration. Today, tourists visiting the Statue of Liberty travel on a ferry boat that carries them first from the mainland to Ellis Island and then from Ellis Island to Liberty Island.
In 1984, a major remodelling of the Statue took place. The work included the replacement of the old damaged torch (now exhibited in the museum), which was substituted with a new one of solid copper. On July 5, 1986 the newly restored Statue of Liberty re-opened to the public. Since then, visitors have been able to walk onto the Statue's observation deck to see the panoramic views of New York City and the harbour and view the Statue up close from her promenade and Fort Wood.

Works Carried out Using Mapei Products

Sometimes a job is more than just a job. When the work involves helping update the base of the Statue of Liberty, it becomes a matter of pride. Mapei, thanks to the technical assistance provided by its American subsidiary Mapei Corp., contributed to the work supplying self-levelers, mortar and grout products, which were used by Phillipsburg Marble Company Inc. in their refurbishment of floors, walkway and walls of the entryway to the Statue of Liberty. Much of the work was done on the third level within the base, which leads to the Fort Wood upper level.
A new handicapped-accessible exit ramp was part of this Life Safety Upgrade Project, which began on April 15, 2004. Stone workers and other employees from Phillipsburg Marble spent several months working on the installation of the granite in order to be ready for the Statue's reopening on August 3, 2004. The materials used in this update had to match those used during the remodelling of the Statue in 1986. An iridian (salt-and-pepper coloured) granite and dark pearl granite were set using GRANIRAPID SYSTEM* and KERACOLOR* grout. But before the granite could be installed, the existing concrete floor had to be repaired and levelled. For this part of the job, the workers used ULTRAPRIME L* acrylic latex primer for concrete and ULTRAPLAN 1* self-

Photo 11.
The original Liberty Torch, replaced in 1986, is now exhibited inside the base of the Statue.

levelling underlayment.
Robert Barron, president of Phillipsburg Marble, chose to use Mapei products because his company has worked with them frequently in the past and has always achieved excellent results. Once Secretary of the Interior Gail Norton announced that final plans had been approved to allow the public to once again enter the Statue's base, the project moved onto a very fast track Using GRANIRAPID SYSTEM* as the mortar allowed the installation crew to set the granite tile and wall panels without delay.
When asked about his overall impression of working on the Statue of Liberty, Barron said: "When Jospeh Natoli (of the Joseph A. Natoli Construction Corp. - the project's general contractor) selected us to do the stone and granite installation, we were proud to play even a small role in helping to once again make the Statue available to visitors. My crew tells me that there was a strong collaboration between all the trades working on the project. Everyone realized that it was a fast-track job; and they were very excited to work on our national monument. It helped everyone come together with pride in the work."
Mapei is likewise proud of the role its products played in helping update the base of America's national symbol of freedom and opportunity.

TECHNICAL DATA

Base of the Statue of Liberty, New York (USA)
Works: repair of the existing concrete floor and installation of granite tiles on the third level within the base and on a new exit ramp
Year: 2004
Project: Highland Associates, New York
Contractor: Joseph A. Natoli Construction Corp., Pine Brook, New Jersey (USA)
Installation Company: Phillipsburg Marble Company Inc., Phillipsburg, New Jersey (USA)
Materials: granite tiles by Cold spring Granite Co.
Mapei Distributor: Phillipsburg Marble Company Inc.
Mapei Co-ordinator: Ed Parma, Mapei Corp.

***Mapei Products:** *Granirapid System, Keracolor S, Ultraplan 1, Ultraprime L.*
The products referred to in this article are manufactured and distributed in America by Mapei Corp. (USA) and Mapei Inc. (CDN). For further information see the web site: www.mapei.com.

1

SAN DIEGO AIRPORT

Mapei R&D Department reformulated Mapecem Premix and Granirapid: the two resulting custom-made products brought new strength to the busy airport concourses.

Photo 1.
The installation has already been completed successfully on the lower level of San Diego Airport.

Photo 2.
The new porcelain tile from Ceramiche Caesar closely matches the existing limestone on the walls.

Photo 3.
Damage to the original limestone on the floor necessitated the renovation.

Golden limestone interspersed with granite tiles was installed on the walls and floors of the San Diego Airport concourses in San Diego, California (USA). Then, passengers began to move across the floors with their luggage. And that's when the problems began. "Unfortunately, the limestone did not wear well or clean well, and it began to crack," says Bob Bolton of the San Diego Airport Authority. "After nine months of testing different solutions to correct the problem, we reached the conclusion that we could not save the limestone on the floors."

Mapei Meets Requirements with Flexible Formulations

Further investigation showed that the mortar bed beneath the limestone also had problems. The welded wire placed in the middle of the mortar bed for added strength had sunk to the bottom, neutralizing its intended support. At this point, Bob contacted his outside consultant, Jim Acri of Acri Stone & Tile Consulting in Aurora,

The MAPECEM PREMIX "S" * special formulation for the American market was so successful that it was recently specified for the New York City School System.

Colorado. Understanding the challenges of replacing entire floor systems in operating facilities, Jim recommended that the airport work with Mapei for the best possible solution.
Bob Bolton had certain constraints under which the work could be done. The airport concourses could not be closed for the installation, and dust and debris had to be kept to a minimum. Bolton also knew that it would be difficult, if not impossible, to set new welded wire in the mortar bed because of the limited access and work area that would be available each day, as well as certain security issues. In addition, the work time was limited to 11 p.m. - 5:30 a.m. in order to reduce any effects on travelers passing through the airport.
With these issues in mind, Bolton knew that he would have to use bag-mix mortar rather than ready-mix concrete. He also wanted the bag-mix because of its reliable consistency and compressive strength, not to mention its to the work area. Plus, he needed a rapid-setting installation mortar to fit into the limited working time available each night. Because welded wire support could not be used, Bolton pushed for fiber-reinforced mortar. He requested through Jim Acri that Mapei make a custom mix for this project.
Mapei's R&D Department started by reformulating MAPECEM PREMIX for the mortar bed. The scientists added fibers to the mix, then tested the results in the laboratory and at the installation site to make certain that it would meet the airport authority's requirements and be workable for the installers. The special formulation passed with flying colors.
The next job researchers tackled was to adjust the characteristics of Mapei's GRANIRAPID – a rapid-setting, yet flexible, latex mortar system – to meet Bolton's stringent requirements for bond strength and compressive strength. Because Mapei makes its own polymers, it has the ability to adapt proven products to meet the needs of specific projects, as the scientists demonstrated with GRANIRAPID.
Mapei's Technical Services team went to the site numerous times to ensure that the newly formulated products gave a proper installation. Mapei's distributor, Daltile, ensured that products were shipped regularly and on time as needed for the installation. Bolton said, "The supply line of materials to our job has been uninterrupted, and all quality-assurance field testing on the products went even better than expected!"


Stages 1 & 2


Stage 3


Stage 4


Stage 5

Matching the Tiles
The Airport Authority decided to replace only the floor tiles, but they wanted the new, more durable tiles to match the existing limestone on the walls. Looking for good quality, good color and pattern consistency, and a reputable company, they turned to Ceramiche Caesar S.p.A. of Spezzano, Modena (Italy). Marco Ferrari, the company's National Sales Manager, said, "It was a big job to make 105,000 square feet of porcelain tile match exactly during production, but we accomplished the task thanks to good teamwork."
Ferrari continued, "Before starting the installation, all lots of our tile were manufactured and approved for specific areas. We produced an 18" x 18" rectified monocottura tile that is three times stronger than marble and even stronger than granite. Each single tile is different, so we matched lots for placement in adjacent areas. For a special fit in some areas of the airport, we did water-jet cutting of the tiles at our plantto pre-cut 18 different shaped field tiles save the installers time at the site." Ceramiche Caesar shipped the tiles in two batches via cargo ship from Livorno (Italy) to Long Beach (California, USA). The tiles were then stored in Anaheim (California, USA), ready for the installers to requisition as needed.

Working with the Best Team
As Cleveland Marble, under the direction of Project Manager Elias N. Ghattas, Foreman Bryan King and his crew began the installation with Mapei's specially formulated products, things started to look good. Ghattas set up the project in five stages:
Stage 1 – Wet-Saw Cutting
The first group of workers used wet saws to cut the limestone from the floor in 2' x 2' square blocks. The wastewater from the cutting was vacuumed up and discarded of in an environmentally safe manner.
Stage 2 – Removal of Old Materials
A second group of workers lifted out the tile and the mortar bed. After removing the old materials, the workers used thick support boards and plywood to keep the floor level for passengers who used the concourses during the day.

Photo 4. San Diego Airport after the project's completion.

Stage 3 – Mortar Bed Placement

The third work group slid a slip-sheet into place and floated the mortar bed. Bob Bolton reported that on a typical night, the group placed 457 square feet of the special MAPECEM PREMIX "S"*, mixing 181 bags. Ghattas set up five mixing locations around the airport to meet the challenges of working with the cement and sand where aircraft engines were running. An extended forklift was used to raise wheelbarrows of mortar to the second floor of the airport facility. The mortar beds set up so well, workers were able to lay plywood over it to level the walking area.

Stage 4 – Tile Setting

The fourth group consisted of the tile installers, who set the porcelain tile with the customized GRANIRAPID System. Ghattas arranged for the GRANIRAPID "S"* to be mixed inside the terminal. His people used a spare utility room whenever possible, or else set up a plastic shed to contain the dust from the mixing operation. In this stage, approximately 500 square feet of tile were set every night. The GRANIRAPID "S"* adhesive cured so quickly, Bob Bolton was able to open the area to traffic even before the space had been grouted.

Stage 5 – Grouting and Sealing

The last group of workers filled the 1/8-inch grout joints with a customized formulation of Mapei's ULTRACOLOR* premium grout to provide a rapid cure and prevent efflorescence.

Partnering for Success

Bob Bolton reported that the San Diego Airport Authority was extremely pleased with the work of all the "partners" involved – Mapei Corporation, Cleveland Marble, Ceramiche Caesar and consultant Jim Acri. "This has been a 15-18 month project," Bolton said, "and Cleveland Marble has been really great with regards to safety, security and cleanliness on the project." He added, "Everyone involved had to be very flexible, especially over the holidays when increased passenger traffic caused delays and adjustments. Jim Acri met with Mapei R&D to fine-tune the products, and Mapei delivered everything on time through their distributor, Daltile.

Followup and support from the local Mapei representatives have been fantastic. Caesar, of course, provided exactly what we wanted with the porcelain tile, which matches the limestone on the wall so closely, it's hard to tell them apart!"

The environmental practices used to minimize the works' impact on local ecology also resulted into a great success. The city of San Diego was so impressed with the Airport Authority's efforts that they awarded the airport their highest environmental recycling award for the second year in a row.

TECHNICAL DATA

San Diego Airport, San Diego, California (USA)
Work: replacement of floor tiles
Customer: San Diego Airport Authority
Project Managers: Bob Bolton of San Diego Airport Authority and Jim Acri of Acri Stone & Tile Consulting
Contractor: Cleveland Granite and Marble, Orange, California (USA)
Installation Manager: Elias N. Ghattas
Materials: tiles by Ceramiche Caesar
Mapei Distributor: Dal-Tile
Mapei Co-ordinator: Mike Granatowski, Mapei Corp.

***Mapei Products:** *Mapecem Premix "S", Granirapid "S", Ultracolor. The products referred to in this article are manufactured and distributed in America by Mapei Corp. (USA) and Mapei Inc. (CDN). For further information see the web site www.mapei.com.*

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Ferrari in the showcase

Ferrari/Maserati sports its USA Corporate Headquarters in historic Englewood Cliffs, New Jersey (USA).

Text by Tina Hansen, photos by Carolyn Anne Ryan, coordination by Diana Chiodi, Mapei Corp.

The story of how Englewood Cliffs has emerged from a turning point in the USA Revolutionary War to a modern, model residential and business community provides many colorful threads in the history of Englewood Cliffs, the home of the Ferrari/Maserati USA Headquarters.
In November 1776 the site was the scene of a heroic encounter that changed the course of the United States. An unknown farmer riding from the north over these cliffs warned General George Washington's men, camped at Fort Lee (on the crest of the New Jersey's famous stretch of cliffs known as the Palisades) that the British were coming. The early warning allowed Washington to successfully enact a strategic retreat thus avoiding a confrontation with a British force

of superior numbers. General Washington's small group of brave, albeit ill-equipped and poorly trained, patriots would surely have been defeated. Had General Washington been captured as planned by British General Cornwallis, it is conceivable that the USA Revolution War would have been lost.
After the end of the war, part of the waterfront beneath Englewood Cliffs became the shipping port of the northern valley farmers who sent great quantities of their produce to New York.
About one hundred years later the Cliffs were threatened with complete annihilation by blasting since after the Civil War the demand for stone, for roads and building foundations, became greater. Public indignation grew strong and in 1897 the New Jersey Federation of Women's Club got to work in earnest and facilitated the final purchase of the land from the quarrymen by benevolent New York millionaires: the Palisades Interstate Park Commission was born.
In 1931 the opening of George Washington Bridge caused a real estate boom in this small town, which consequently adopted its first building and zoning code. These were the early blocks that made a community of one-family houses without high-rise apartments able to coexist with business and industry on what was to be later labeled the "Billion Dollar Mile" of business and international corporation offices on Sylvan Avenue.
It is just in Englewood Cliffs that Ferrari established its USA headquarters and a big show room sporting both its famous vehicles produced in Maranello (Italy) and the latest cars by Maserati. Ferrari North America is the sole importer and distributor of Ferrari cars and genuine Ferrari parts. The company functions as the hub of the authorized dealer network in Ferrari's largest market, and sponsors a variety of sporting and cultural events including the racing series: The Ferrari Challenge.
Overlooking the Palisades, Ferrari shows off its famous vehicles through a glass enclave that towers over the side of the road.
Ferrari/Maserati has a reputation for making very nice cars. Beyond this reputation lives a long history of quality craftsmanship and engineering, multiple race awards, and a line of admirers and aficionados. There should be no doubt that every detail in its showroom should be as perfect as the cars it features. So when it came to renovate the showroom floor special care was given to the products used and how they should be installed. Two others Italian leaders were chosen: Fiandre tile and Mapei. Fiandre supplied the custom-made 24″ x 24″ (60x60 cm) "Ferrari Maserati" porcelain tile. The installation system was Mapei. "Every contractor should think of using Mapei's products if they want to ensure an installation that won't fail on them," states Shawn Arora, Vice President of Orba Tile and supervisor of the installation at the Ferrari jobsite. Arora should know about the importance

Photo 1.
Ferrari/Maserati USA Headquarters


2


3


4

Photo 2.
Tiles being installed in the showroom.

Photos 3 and 4.
Mapei products, namely Kerabond and Keralastic, being used to install the white Fiandre custom-made porcelain tiles on the floors of the main lobby. The job was grouted by using stain-free Kerapoxy grout.

Photo 5.
The floors of the car depot were installed by using Mapei products.

Photos 6 and 7.
Pictures of the showroom once the installation work has been completed.


5


7

6

of quality installation systems - his company has been involved in multiple high profile projects in New Jersey such as the Newark Airport, the Rutgers State University and St. Michael's Hospital - all of which required minimal down time and a guaranteed job against failures."All Mapei's installations are lifetime installations. We use Mapei because of the guarantee of success we know we can count on in every job we do," he states.

Arora has been using Mapei products for over ten years and has not yet received a call back for job failure.

The installation project consisted of the floors of main lobby and of car depot and also included the floors and walls of the bathrooms.

3,000 sq. ft. 279 m² of pristine white large-size porcelain tiles were installed over an existing concrete substrate by using KERABOND*, a cementitious adhesives for ceramic tiles for interior and exterior floor and wall bonding of medium sized ceramic tiles and mosaics for environments that are not particularly stressed.

In order to improve the performance characteristics, KERABOND* was mixed with the resin adhesive KERALASTIC*, which is equivalent to ISOLASTIC. In the bathrooms, 8"x 8" (20x20 cm) glazed wall tiles were installed with the adhesive MASTIC TYPE 1*, to complement the showroom floor.

The entire job was grouted using stain free KERAPOXY* grout. RM

***Mapei Products:** Kerabond, Keralastic, Kerapoxy, Mastic Type 1. The products referred to in this article are manufactured and distributed in America by Mapei Corp. (USA) and Mapei Inc. (CDN). For further information, see the web site: www.mapei.com.*

TECHNICAL DATA

Ferrari/Maserati Corporate Headquarters, Englewood Cliffs, New Jersey (USA)
Work: installation of floor and wall tiles
Year: 2002
Customer: Ferrari Italia, Maranello (Italy)
Installation Company: Orba Tile
Materials: Fiandre tiles (for the showroom)
Mapei Distributor: Dal-Tile
Mapei Co-ordinator: Ed Parma - Mapei Corp.

DRILLING HAS BEGUN ON THE SAN GOTTARDO TUNNEL

When the going gets tough, the tough get going.

Text by the UTT - Mapei Underground Technology Team

"The breakthrough of the final diaphragm between the Canna di Bodio and the rock tunnel through the West Tube on the Alp-Transit San Gottardo SA building site in Bodio-Pollegio marked the beginning of "drilling" operations on the San Gottardo Tunnel.
Carried out by the Consorzio Matro (Pizzarotti S.p.A., Muttoni SA, Ferrari SA, Fondazioni Speciali s.r.l.), work on the technically tricky approximately 400-metre-long "loose material section" began in September 2000."

This press release from 25.11.2002, which also appeared on the web site www.alptransit.ch, was how the contracting company Alptransit S.A. announced the news that drilling had begun on the opening section of the San Gottardo railway tunnel.

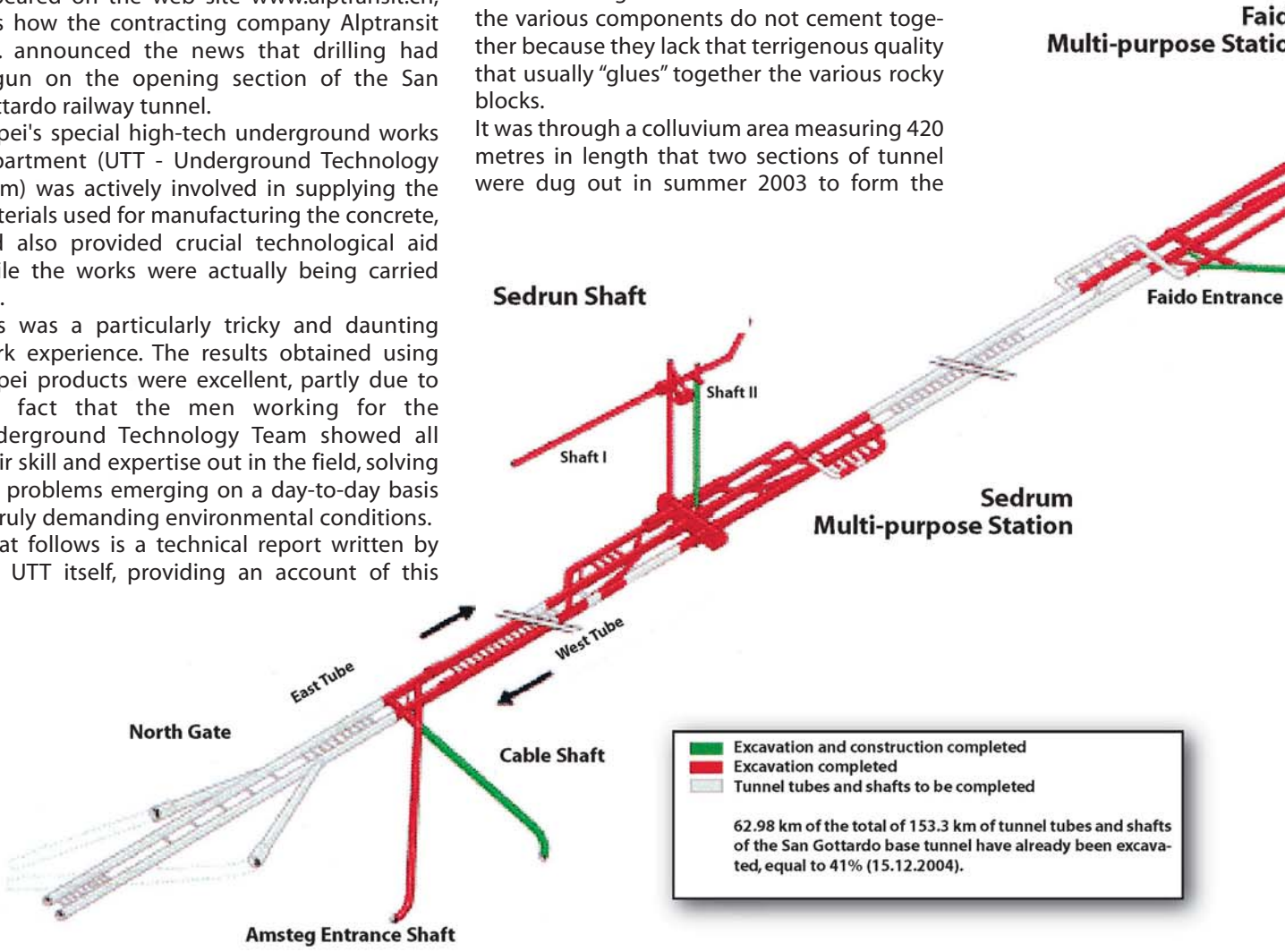
Mapei's special high-tech underground works department (UTT - Underground Technology Team) was actively involved in supplying the materials used for manufacturing the concrete, and also provided crucial technological aid while the works were actually being carried out.

This was a particularly tricky and daunting work experience. The results obtained using Mapei products were excellent, partly due to the fact that the men working for the Underground Technology Team showed all their skill and expertise out in the field, solving the problems emerging on a day-to-day basis in truly demanding environmental conditions.

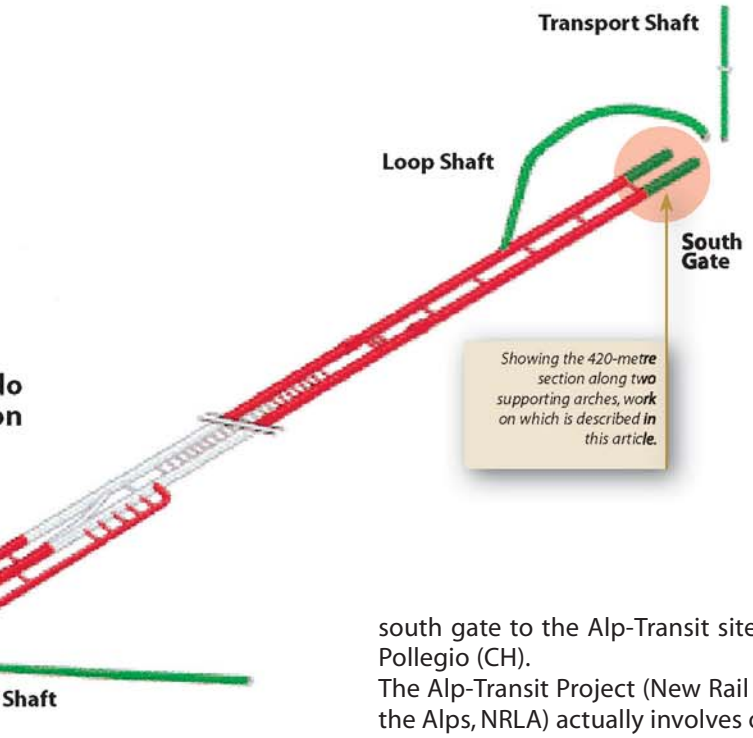
What follows is a technical report written by the UTT itself, providing an account of this important work experience, a challenge that Mapei people met with great success.

Colluvium is the trickiest thing to handle when tunnelling. Geologically speaking, it comes from a build-up of material tumbling down the mountainside, that breaks away due to the effects of atmospheric agents like frost and rain and then falls due to the force of gravity and the flow of rain water until it forms a sort of pile of material of highly varied particle size. This forms a pile that sediments over time, filling several cubic metres with clay-like particles measuring a few microns in diameter. But the various components do not cement together because they lack that terrigenous quality that usually "glues" together the various rocky blocks.

It was through a colluvium area measuring 420 metres in length that two sections of tunnel were dug out in summer 2003 to form the



Buzza di Biasca



south gate to the Alp-Transit site, near Bodio-Pollegio (CH).
The Alp-Transit Project (New Rail Link through the Alps, NRLA) actually involves one long tunnel, which, when it is completed, will allow trains to cover the 57 kilometres from Bodio to Erstfeld along one single underground section. This is known as the San Gottardo base railway tunnel, the project for which was divided into five different length parts in order to complete the works as quickly and economically as possible by digging in several places at the same time.
The south gate, the so-called Bodio section, is the longest part of the base tunnel and, considering the tricky geological situation involved, the two 420-metre-long entrance ways were really a challenge within a challenge for the Alp-Transit project. A tender was even organised for them, that was then awarded to the Matro Consortium (Muttoni SA, Pizzarotti S.p.A., Ferrari SA, Fondazioni Speciali s.r.l.). The company ended up tackling the first section by conventional method of exacavation, followed by mechanized tunnelling (for which another tender was arranged), once the solid rock section was reached.
Usually, work progresses by digging out a section of tunnel whose length is set in relation to the quality of the material being worked (small distances in the case of low-quality material). Steel arches and anchorings are then set in place, followed by sprayed concrete serving support and safety purposes.
Since in this case the ground crossed was highly unstable, face injections had to be made first using fiber glass tubes with cement-based grouts and 15-metre forepoling constructed with 3-metre overlaps. High-quality sprayed concrete with very high mechanical compressive strength development also had to be used to support the tunnel.
Strict preliminary tests were carried out before starting tunnelling, in order to assess the effectiveness of the systems planned to be used. At the end of the trial tests it was found that the Mapei-UTT system, outlined below, was the best of all:

Cement Type I 42,5	420 kg
W/C ratio	0,45
Crushed sand 0/4	70%
Crushed gravel 4/8	30%
DYNAMON SX* superplasticiser	1%

The mix design prepared by the Mapei Underground Technology team resulted in a S5 class consistency concrete with no bleeding, with slump retention of over 2 hours and excellent rheological properties, guaranteeing mix pumpability and as well accelerator dispersion during the spaying phase.
Two different types of alkali-free accelerators were used: MAPEQUICK AF 1000* for "ordinary" working conditions and MAPEQUICK AF 2000* when having heavy in-flows of water in the tunnel. MAPEQUICK AF 1000* ensures fast setting time and, at the same time, good compressive strength development (at 24 hours

R_{ck}=15-20 N/mm^2); MAPEQUICK AF 2000*, thanks to its even quicker setting time, guarantees self-bearing capacity of shotcrete, even in presence of flowing water on the surface.
The amount of accelerator used was set by a special computerised dosing unit, according to the production rate (approximately 22 m^3/hour using a CSS - 2 spritz system CIFA pump), which is exactly 7% on weight of the cement (approximately 29 kg of accelerator per cubic metre of concrete) for MAPEQUICK AF 1000* and 6% in weight of the actual weight of the cement for MAPEQUICK AF 2000* (25 kg of accelerator per cubic metre of concrete).
The lining of sprayed concrete was made in thicknesses of between 20-80 cm, with a gradual increase in thickness every 12 metre close to the overlaps between the different forepoling sets (where the thickness was at least one metre) and was shouted in one single uninterrupted spraying phase.
Using such high-performance sprayed concrete (at 28 days R_{ck}=40-50 N/mm^2), convergence in the tunnel cavity could be controlled even in the presence of unstable and heterogeneous materials. Such a high quality shotcrete allowed as well to have a waterproofing lining. Similar results were also favoured by the high-tech properties of products like the DYNAMON* acrylic superplasticiser, which confer fluidity to concrete with low water/cement ratios and, most particularly, MAPEQUICK AF* alkali-free setting accelerator, which already meet European directives (soon to be enforced) for sprayed concrete.
We are proud to announce that an all-Italian team (firm, suppliers of materials and machinery), working to Swiss rules and regulations, managed to successfully complete a highly complex project up to the expected standards. This testifies to the high technological standards and know-how of Italian industry in this sector, which now seems to have a bright future, as well as a great past to constantly draw on.

TECHNICAL DATA

Alp-Transit San Gottardo Railway Tunnel, Bodio-Pollegio (CH)
Years: 2001-2003
Customer: Alp-Transit Gotthard AG, Bodio-Pollegio
Contractor: Consorzio Matro (Pizzarotti - Muttoni - Ferrari - Fondazioni Speciali)
Project and Works Management: Ingenieurgemeinschaft Gotthard-Basistunnel Süd (Lombardi AG - Jaakko Pöyry Infra - Amberg Engineering)
Mapei Co-ordinator: Mapei Underground Technology Team, Mapei Spa

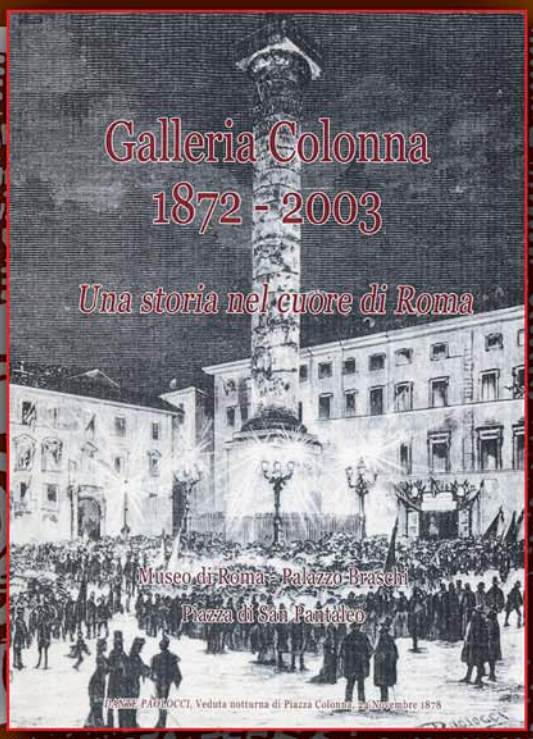
***Mapei Products:** *the products referred to in this article belong to the "Admixtures for Concrete" and "UTT" ranges. The technical data sheets are available on the "Mapei Global Infonet" CD/DVD and at the web site: www.mapei.com.*
***Dynamon SX:** superplasticizer based on modified acrylic polymer for concrete with low water/ cement ratio for traditional and self-compacting concrete.*
***Mapequick AF 1000:** liquid accelerator based on alkali-free, organic salts developed for shotcrete with very rapid setting time.*
***Mapequick AF 2000:** liquid accelerator based on alkali-free, inorganic salts developed for shotcrete with very rapid setting time.*

The Underground Technology Team **(UTT)**, Mapei's superprofessional squad for handling underground works, will soon have its own web site at: **www.utt-mapei.com**. The aim is to meet all its clients' technical needs in real-time as far as underground constructions are concerned. In addition to an updated presentation of the full range of Mapei products for every need and situation, the site will basically provide the chance to get directly in touch with everybody working in this field, that look likely to expand in the near future.
An international renowned organisation like the UTT could not afford to overlook such an important means of communication, as the team is set to take on truly global status.

utt
UNDERGROUND TECHNOLOGY TEAM

New Life for the Arcade

The Galleria Colonna in Rome, which has finally re-opened its doors to the general public after years of being closed, is now named after the famous Italian actor Alberto Sordi.



"Light has now returned where previously there was only darkness", are the words the Mayor of Rome, Walter Veltroni, used at the re-opening of the Galleria Colonna on 4th December 2003. The arcade is now named after the Italian actor Alberto Sordi, who actually began his long career in the theatre that used to be here. The complex renovation operations on the arcade facing onto Piazza Colonna served the objective of helping revamp and cast fresh light on the treasures, great and small, that certainly are not lacking in the city of Rome. The arcade's cultural and commercial modernisation actually involved restructuring and redeveloping the building in careful respect to its original vocation as a shopping arcade gallery. This has been achieved while constantly keeping in mind its historical-artistic value and the architectural setting in which it is located. This is an important project of great symbolic force, considering that, unlike Milan and Naples, there are no arcades in Rome. Lost amongst all the marble and stucco work inside, it is like going back in time. The arcade actually officially opened in the early-20th century, before being closed down and left to go to rack and ruin; for a number of years, 13 to be exact, the people of Rome were no longer able to walk between the columns and beneath the multi-coloured glass panels of the Liberty-style vaults.

Renovation work, which began in 1999, took 48 long months and cost 50 million Euros. It was all carried out in meticulous detail: like for instance the re-facing, originally planned to be carried out years ago but never completed due to a lack of funds, of the mosaic floor with dark red circular patterns, for which Mapei supplied the installation products.

A team of expert labourers using quality materials and cutting-edge products worked day and night on the renovation work, together with about a hundred carpenters, masons, electricians, smiths and decorators, so that it was ready to open on 4th December. The arcade is shut behind

gates that open from 8 a.m.-10 p.m. and at the moment contains thirty-five shops, including a huge book shop, and is completed by an underground car park with room for 2,000 vehicles and glass windows closing off the entrances along the high street and Via Santa Maria. A power air-conditioning system hidden away behind the awnings makes the arcade a haven sheltered against the summer heat and winter cold. In addition to shops, the top part of the arcade will soon house offices for the Prime Minister.

The Arcade's Historical Background

The long history behind the arcade's construction began back in 1872 with a proposal to extend Piazza Colonna after the demolition of Palazzo Piombino. The widest possible range of design projects and ideas (one of the projects actually envisaged building an arcade similar in size to the one in Milan) saw the people of Rome involved in heated discussions until the final decision was made in 1911 to approve the project by the architect Dario Carbone.

But it was another ten years before Colonna Arcade was actually completed: it was officially opened only on 20th October 1922. The arcade's fate was closely tied to the new role played by Piazza Colonna in the city's socio-political life after the unification of Italy in 1870.

The fact that Palazzo di Montecitorio, the building chosen to host the Italian House of Representatives, was so nearby meant the square was much more busy and turned into a congregation point for the multifaceted world of journalists, clients and brokers on the fringe of the world of politics. Its public function was further enhanced when the headquarters of the Italian mail service was moved from Palazzo Madama, now used to hold the Italian Senate, into the building on the edge of the square over on the Montecitorio side, where the Ministry of Education was also located for a while.

The Philosophy Underpinning the Renovation Work

The reason for the restructuring and other works was always the same right from the start: to fit in with the existing structures and not alter the static behaviour of the entire complex. At the beginning of the works, which happened in August 1999, the structural surveys and geological research uncovered the nature of the ground, most significantly checking and verifying whether the position of the fault referred to in the papers was the same as its real position 90 cm below the floor surface in the underground level. Studies were then carried out to check the correlation between this fault, the votive water in nearby Santa Maria in Via Church, and the water running beneath Via del Tritone, assessing how it interacts with flooding of the Tiber.

It was found that there were a number of communicating "compensation chambers", which even now prevent the water level, in certain weather conditions, from rising to the base of the construction and flooding the building. The old technical handbook was extremely useful and interesting for analysing the building structures and construction features composing it, making it possible to check the technology and materials used back then. After completing the monitoring and analysis of all construction features, the works proper began in January 2001 with the knocking down of all the building work constructed over the original architecture and radical repair work on the existing structures, while deliberately holding onto their geometric design and key features. Examining the documents and papers found and kept in the Rome City Archives made it possible to create the mosaic, that was originally supposed to decorate the arcade but was never actually installed for financial reasons, exactly as it was designed by the architect Dario Carbone. The glass surface of the roof awning and all the decorations and mouldings on the walls inside the arcade were restored to their former state. Lengthy restoration and cleaning operations uncovered the ornamentation made of "pavonazzetto" marble decorating the central area in the very heart of the arcade originally used for banking purposes and then later adapted for film and variety shows. Special care was also taken over repairing the lighting inside the arcade by restoring and, in certain cases, copying the original globes. The air-conditioning system, the modern entrance doors transparent so as not to alter the facades, the adapting of the electrical and fire-fighting systems, the sound insulation and the improving of the safety mechanisms, all helped improve the building's quality standards, adjusting it to modern operating needs.

Mapei's Work

Mapei contributed to these complex works, involving the renovation of 4,000 square metres of flooring, 3,400 inside and 600 outside, by supplying the products for laying the deco-

rative mosaic. TOPCEM* mixed with gravel varying in grain size from 0-8 mm for thickness ranging between approximately 4-6 cm was used for making the screeds inside the areas designed for holding shops.

A sheet of polyethylene was also applied for sunscreening purposes. The substrate of TOPCEM* was preferred for controlled shrinkage that takes place within 24 hours of casting and to ensure high mechanical resistance (30 MPa after 28 days' curing at 23°C and 50% relative humidity), which makes it ideal for taking flooring subject to constant, heavy traffic, as is the case here. After 4 days the product has a residual humidity rating of 2%, making it ideal for laying any kind of humidity-sensitive flooring (stone material, resilient material, wood), and it can be walked on after just 12 hours.

This latter is a valuable and indispensable factor in preventing the installation work from being interrupted.

All the surfaces in the arcade and shops were treated using PRIMER G*, a synthetic resin-based primer mixed with water used prior to smoothing to make the substrate evenly absorbent all over. The surface was the levelled using ULTRAPLAN* to get the substrates ready to be installed with flooring subject to heavy traffic.

Next the precious mosaic made of Botticino marble in the colours Verona red and Issoria green was installed in the central arcade, opting for the formats 2x2 cm, 1.5x1.5 cm and 1x1 cm, all in a thickness of 10 mm, carried out using ADESILEX P10* mixed with ISOLASTIC* instead of 50% of the usual water. This resulted in a product with better adhesive properties and more elastic (class C2TE/S1), ready for taking traffic or being grouted within 24 hours. ULTRACOLOR* was used for the grouting because, in addition to perfectly even colour distribution, is does not generate efflorescence and is quick drying.

Outside, in front of the entrance to the arcade and opposite Piazza Colonna, 3 mm thick 20x20 cm and 60x100 cm slabs of Botticino marble were laid using white GRANIRAPID* adhesive, ideal for both natural and artificial stone. GRANIRAPID* is always used when looking for a two-component installation system ideal for rapidly refacing surfaces requiring, as in this case, quick installation. The entire job was grouted by using the fst drying mortar ULTRACOLOR*. MAPEFILL*, a high-flow non-

shrink grout that is extremely adhesive, has high mechanical resistance and meets the designer's elasticity requirements, was used for anchoring the concrete substrates to the metal carpentry of the shops and metallic housings.
The restructuring of the arcade showed that technology and works of art can be brought together, and it is certainly a fine example of how to redevelop an old building that would otherwise be slowly left to fall apart.

Photos by Pino Mancini.

TECHNICAL DATA

Galleria Colonna, now known as Galleria Alberto Sordi, Rome (Italy)
Work: renovation and restructuring of the Galleria including screed making and installation of the mosaic and marble floor slabs
Years: 1999-2003
Customer: Immobiliare Colonna s.r.l., Rome (Italy)
Project and Works Management: architect Bruno Moauro
Contractor: Lamaro Appalti SpA Roma
Installation Company: Memorie Srl
Mapei Distributor: products for laying floors, Innamorati Edilizia (L'Aquila, Italy); products for other jobs, Lamaro Appalti (Rome, Italy)
Mapei Co-ordinators: Pino Mancini and Renato Soffi

***Mapei Products:** *the products referred to in this article belong to the "Products for Ceramic Tiles and Stone Materials" and "Building Speciality Line" ranges.*
The technical data sheets are available on the "Mapei Global Infonet" CD/DVD and at the web site: www.mapei.com.
Mapei adhesives and grouts conform to EN 12004 and EN 13888 standards.
***Adesilex P10 (C2TE):** white high performance cementitious adhesive with no vertical slip and extended open time for glass, ceramic and marble mosaic coverings*
***Granirapid (C2F):** high performance, deformable, fast setting and hydration two-component cementitious adhesive for ceramic tiles and stone material*
***Isolastic:** flexible latex additive to be mixed with Kerabond, Kerafloor and Adesilex P10*
***Mapefill:** high-flow shrink-free grout for anchor*
***Primer G:** synthetic resin-based primer in water dispersion*
***Topcem:** normal setting, rapid drying (4 days), special hydraulic binder for screeds*
***Ultracolor(CG2):** high performance fast setting and fast drying mortar for grouting joints of 2-20 mm, available in 26 colours. it does not generate efflorescences. **N.B:** The product has been replaced by Ultracolor Plus*
***Ultraplan:** ultra-fast hardening self-levelling smoothing compound.*

Salle Omnisports

A superb sports facility built in Carmaux (France).

Text by Renaud Canuyt, Mapei France SA

Inside of the Carmaux Sports Centre, a modern hall designed for all kinds of indoor sports.

1

Sports facilities are settings in which Mapei products are being used more and more. One of the most recent constructions is the sports centre Salle Omnisports in Carmaux (France).

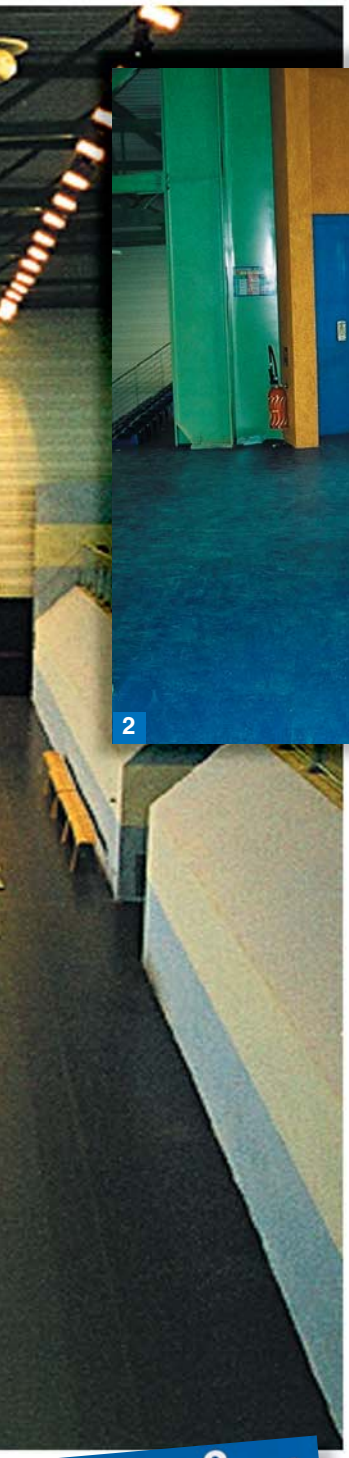
Innovative solutions for laying the floors had to be used to meet the client's requirements, i.e. the Carmaux City Council working with the economist Mr. Davi.

On one hand a coating of PVC sheets had to be laid over a surface of 1,000 m^2 made of anhydrite, incorporating a hot-water circulation floor heating system, and, on the other, a coating of square PVC panels needed to be installed over an area of 400 m^2 in the communal areas (terracing, corridors and other passage ways). The installation company which won

Photo 1.
Outside of the building holding the Salle Omnisports.

Photo 2.
The passage way area at the top of the stands. Installation was carried out using Ultrabond Eco V4SP universal adhesive.

Photo 3.
The covering over the stands was carefully bonded again using Ultrabond Eco V4SP.

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this tender decided to use Mapei products for carrying out the work, as it did for many other works in the past.
As regards the sports hall floor, the installation company first carried out smoothing operations by scraping the surface until it was as flat as required.
It then carefully performed all the operations required for installation over plaster-based (calcium sulphate) substrates, in other words complying with the schedule for installation and testing the residual humidity rating allowed, which must not exceed 0.5%.
After applying PRIMER G*, a synthetic resin based primer in water dispersion with very low emission of volatile organic compounds (VOC), the "Taralay Sport Performance" PVC flooring sheets were laid using ULTRABOND ECO V4SP*, a universal adhesive in water dispersion with extended open time and very low emission of volatile organic compounds (VOC). This product's distinctive features, notably the absence of solvents certified by the German TFI institute, were much appreciated by the installation team.
The concrete substrate in the corridors and up in the stands was prepared using PRIMER G* and then smoothed using PLANO 3*, a fast-hardening self-levelling smoothing compound.
The covering over these surfaces, made of PVC squares, was also installed using ULTRABOND ECO V4SP*, a product whose versatility is clearly brought out in this project.
This superb construction opened in January 2003 and since then has hosted lots of volleyball and basketball matches.
Good luck to all the teams fortunate enough to play in this brand new centre.

Our thanks go to "Mapei & Vous", n. 8, from which this article was taken.

***Mapei Products:** the products referred to in this article belong to the "Products for the Installation of Resilient, Textile and Wood Floor and Wall Coverings" and "Building Speciality Line" ranges. The technical data sheets are available on the "Mapei Global Infonet" CD/DVD and at the web site: www.mapei.com.*

***Primer G:** synthetic resin based primer in water dispersion.*
***Plano 3:** rapid hardening self-levelling smoothing compound, especially suitable for pump applications.*
***Ultrabond Eco V4SP:** universal adhesive in water dispersion with extended open time and very low emission of volatile organic compounds (VOC) for resilient flooring.*

TECHNICAL DATA

Salle Omnisports, Carmaux (France)
Work: installation of indoor PVC floorings
Year: 2002
Surface Area: 1,400 m²
Customer: Carmaux City Council, Carmaux (France)
Contractor: Campo, Millau (France)
Materials: "Taralay Sport Performance" PVC sheets and "Taradal" square PVC panels by Gerflor
Mapei Distributor: Seguret Decoration, Rodez (France)
Mapei Co-ordinator: Yves Caussanel, Mapei France SA

AVON RUNNING 2005

On Sunday 15th May, Milan was the women's running and athletics capital. The Avon Running 2005 Women's Run, was successfully held on a splendid spring summer day, with over 7,000 contestants: a record for Milan and for Italy. The Milan stage of this international circuit, run in 50 countries, thus is getting increasingly closer to the top world events in New York (8,200 contestants) and Berlin (11,000). A spectacular route - starting from and ending at the Arena, and passing by the Castello Sforzesco La Scala Theatre, Via Montenapoleone and the Duomo - provided a 5 km untimed race for most of the participants, while over 400 athletes and champion runners competed in the major competitive event of the year in Italy over 10 km.

The winner of the 10 km competitive race was **Vincenza Sicari** (33'46"), who went into the lead from the start. **Gloria Marconi** (33'55") arrived second: in the early part of the race the Roman athlete tried hard to keep up with Sicari, but finally had to give up. In third place was **Silvia Sommaggio** (34'00"), ahead of **Patrizia Tisi** (34'04"): the Co-Ver Mapei Running Team athlete said that she was in any case very pleased with her performance, given all the problems she has had over the past months which prevented her from training as she would have liked. Overall, the performance of the whole Co-Ver Mapei Running Team was good.

In fact, **Giustina Menna** (35'23") came in eighth: this athlete from Naples, who after an excellent start in the group led by Patrizia Tisi, faded in the final kilometres. Behind her came **Tiziana Alagia** (35'30"), ninth, while **Maria Cocchetti** (36'09") came 12th. **Maura Viceconte** (37'53") also competed in the Milan race, finishing in the 16th place. As predicted, aside from the importance of the competitive race, the day was an occasion to celebrate sport, health and wellness with enormous enthusiasm, festivity and enjoyment.

Walking, running and doing aerobics. Indeed the day continued inside the Milan Municipal Arena after the race too, with the **Mapei Fitness Show**: fitness and aerobics lessons-exhibitions, held by expert international instructors, for all women of all ages who love keeping fit with music, including little girls, mothers, grandmothers, but also

7,000 women run for one man: Professor Umberto Veronesi starts the Avon Running 2005 race.

FOR SPORT AND RESEARCH

groups of girlfriends, women who work together and school friends.

One of the most curious things of the day was the ages of the youngest and oldest participants: Alessandra, aged only 3 months and "grandma Giulia" aged 78.

Participation also meant making a contribution to the bat - tle against breast cancer since the entrance fees were donated in full to Umberto Veronesi's European Oncology Institute. Indeed Professor Veronesi was present at the race and was very warmly welcomed at the event. He jokingly said that he had been appointed an "honorary woman", but then seriously added that everyone has a moral duty to help those who suffer.

"Mine is a message of hope, but also of certainty," he concluded, "because cancer must be cured."

In particular, the 70,000 or so euro collected this year, will be used for a special research project: evaluation of the tumour cells circulating in patients suffering from breast cancer and the necessary treatment.

Mapei was an official Avon Running 2005 sponsor.

This confirms the on-going interest of the Mapei Group in sport and in running in particular. This interest has materialised over the years in three directions: the activity of the Mapei Sport Service, a structure with efficient sports research laboratories and assistance services for athletes; sponsorship of the prize-winning sports team Co-Ver Mapei; sponsorship of high-profile events in the running world. Mapei's connection with the running world thus continues to growth through ever greater synergies between competitive sport, communications and scientific research applied to sport.

Yet it is also marked by commitment to making sport not just a hobby for true enthusiasts, but a means for improving the quality of life and of the environment: a commitment that is attuned to the Mapei Group's philosophy, proven by the fact that their major production unit (Robbiano di Mediglia, Italy) has obtained ISO 14001 certification for its Environmental Management System and EMAS (Eco-Management and Audit Scheme) registration, to which Integrated Environmental Authorisation was added last December.

The decision to sponsor the Avon Running event served a dual purpose: indeed, it derived not only from Mapei's interest in sport, but also from their wish to support a major event in favour of research to prevent and fight breast cancer. This is in line with two basic principles of the company's philosophy: research, a sector in which Mapei invest 5% of their turnover each year, and commitment to social issues.

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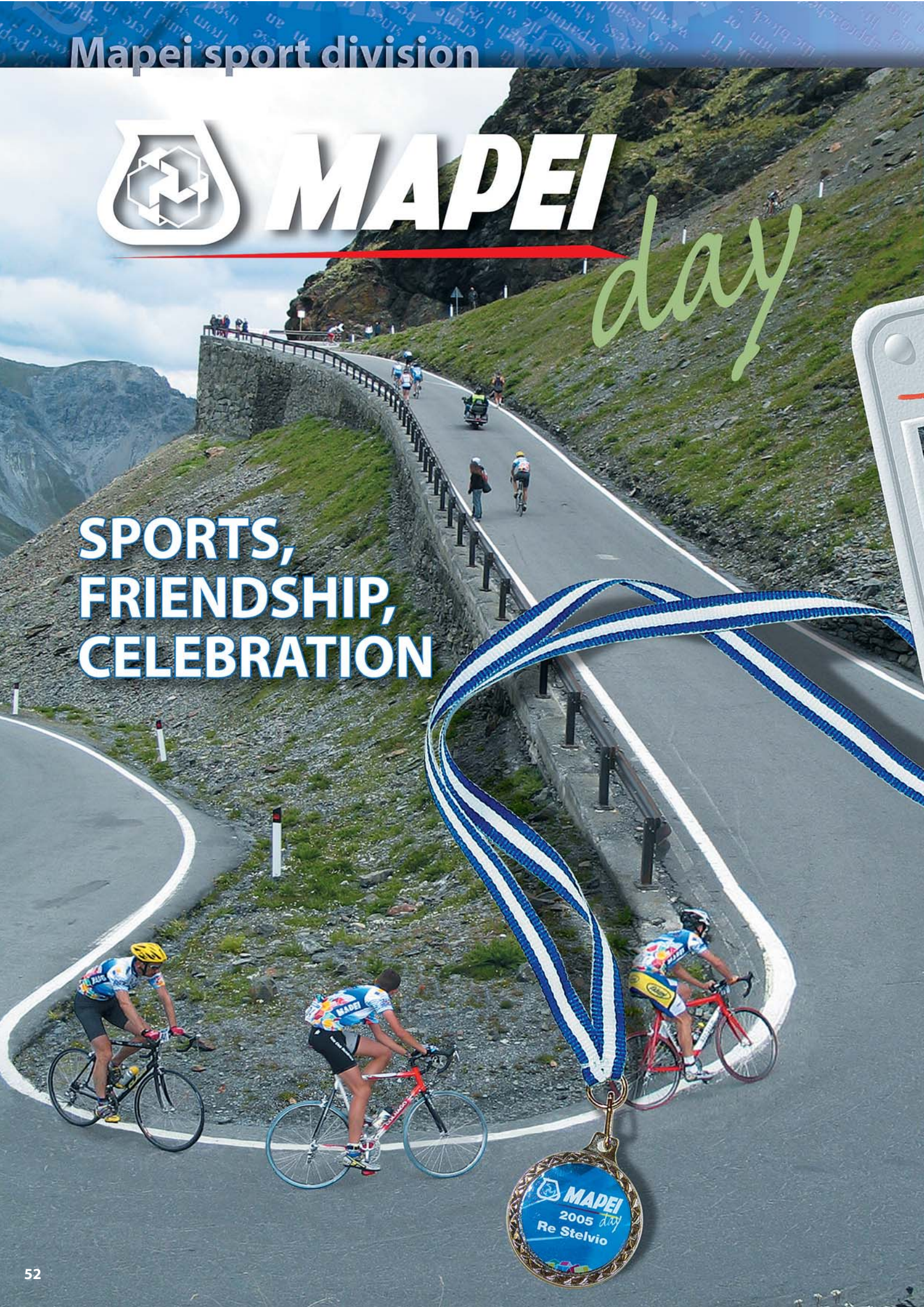
MAPEI
day
SPORTS,
FRIENDSHIP,
CELEBRATION
MAPEI
2005 day
Re Stelvio

The height of summer - 10 July - and yet snow flurries made their appearance.
What better way to remind us that mountains are beautiful - but also a lot of hard work?
This was a day of sports in grand style and a marvellous celebration. Mapei Day was held in Bormio along a route up to the summit, following the Strada Imperiale that leads to the Stelvio Pass, the legendary Coppi Summit.
This was a unique opportunity, a true challenge for all those who wanted to test their skill against other competitors and take on an altitude difference of over 1,500 metres, extending for 21.97 kilometres from Bormio to the pass. The route and slope require meticulous preparation, not only because of the steep climb, but also because of the altitude, which makes everything more difficult.
The day envisaged three events along the same route: the "Re Stelvio" cycling event, the mini-marathon for Fidal members (the Italian Track and Field Federation), and a cycling rally for members and non-members alike, together with former Mapei athletes and other sports personalities.
The group of about 1200 cyclists and runners gathered for this event, established to continue and strengthen the commitment the Mapei Group has made to the world of sports. The goal was to bring together all those who have contributed to it over the years as customers, designers, athletes, supporters, friends and acquaintances. Three key partners contributed to the success of this extravaganza: the Banca Popolare di Sondrio, the US Bormiese and Pirovano (the famous "University of Skiing"). The "Re Stelvio", a US Bormiese exclusive, was first held 21 years ago. From the very beginning, this race - reserved for amateur cyclists - has offered hundreds of enthusiasts from Italy and around the world the opportunity to attempt the quintessential challenge of the Coppi Summit.
In the mini-marathon, Giuliano Battocletti clearly dominated. A member of the Co-Ver Mapei Running Team, Battocletti took first place, covering the distance from Bormio to the Stelvio Pass in 1h31'21", and averaging about

Saturday, 9 July, 10 a.m.: 100 astonished fanatics on the snow at the Geister piste!

8 p.m.: have a seat, it's show time!

13 km/h. This is an extraordinary feat, considering the fact that the climb on the Valtellina side has an average gradient of 7.6%. Placing behind Battocletti was Zsolt Zsoder, a strong triathlete but also the friend and trainer of Aniko Kalovics, the standard-bearer of the Co-Ver Mapei Running Team.

Team President Gianpaolo Pizzi also completed the mini-marathon, whereas Mapei Group President Giorgio Squinzi, accompanied by Aldo Sassi, head of Mapei's Sport Service, and Franco Ballerini, Italian national team cycling coach, rode across the finish line at the Coppi Summit for the 2005 Tour.

They and all the Mapei Day participants deserve a big round of applause, especially considering the weather conditions during the competition (as we said, it even started to snow!).

Above all, Mapei Day was a big celebration. It was an opportunity to deepen friendships and meet the people we speak to on the phone day after day, but strictly for work. Though Sunday marked the competitive climax, the event actually started on Saturday with a ski race in which all of Mapei's skiing friends participated. On Saturday guests and companions also had a chance to visit the trenches of the First World War and relax at Bormio's spa centres.

On Saturday evening there was a dinner at the Pentagono Palace in Bormio, which was also attended by an array of well-known personalities, from Gustav Thoeni to Kristian Ghedina, Gianni Bugno and Andrea Tafi. This social occasion also helped soothe the competitors' pre-race jitters. During the dinner, Fr Antonio Mazzi auctioned a bicycle he was given by Ernesto Colnago. The winner was Michele Perini, President of Fiera Milano, and the proceeds of the auction will go to charity.

Above and beyond any underlying strategic objectives, the real winner at this event was the sheer joy of participating. Mapei Day was a lot of different things: happiness, friendship, hard work, competition and enthusiasm. A whirl of emotions that no one will ever forget.

Sunday, 10 July:
9:30 a.m:
ready
at the starting line

the climb... is gruelling

... and here we are
at the finish line

We will soon publish
a Mapei Day photo album as a keepsake.
In the meanwhile, plenty of photos are
available at the web site www.mapei.it.
Have a look, you might find your own!

Doing it all over again:

Interview with Giorgio Squinzi

Mr Squinzi, you just got off your bicycle and it's about to snow. How did this legendary climb go?
I'd say…it went well. This is a climb that all cyclists dream of attempting sooner or later, and I am particularly thrilled to reach the top 13 years after my last ascent to the Stelvio Pass. But that time, I climbed it from the Trentino-Alto Adige side.

Did you do any special training to prepare for it?
The preparation prior to the event was marvellous, and quite unforgettable in many ways. Starting in mid-April, my Sunday bicycle outings focused mainly on uphill routes. My son, several friends and colleagues, and I looked for the most demanding and traditional roads through the Alpine foothills in Lombardy, like Ghisallo and the Wall of Sormano. The final test, the last demanding climb with characteristics almost identical to those of the Stelvio, was on Mount Mottarone. We truly had a marvellous time….

Aside from your participation in the race, what has Mapei Day meant to you?
It has been a unique opportunity to get together to talk about work and sports in a festive atmosphere. Moreover, knowing that you will face a difficult sports challenge charged the entire atmosphere: friends, customers, athletes. It was a personal challenge for everyone from an athletic standpoint, but this did not keep us from laughing and enjoying each other's company like true athletes.

Is there anything in particular that surprised you?
Yes, I was very moved to see so many athletes from the old Mapei team who spontaneously participated in this event. I was very surprised and touched by their loyalty to the team. I was also delighted that Giuliano Battocletti, an athlete from the Co-Ver Mapei Running Team, won this important footrace.

It was a wonderful day of sports and enormous effort for everyone. Mapei Day was a resounding success. Did you expect this?
The desired to better ourselves constantly and achieve ever-new goals is part of the Mapei philosophy. On days like this, everyone can see that, for Mapei, sport is not an abstract concept, a metaphor we use to explain corporate concepts, but the very essence of how we approach work and difficulties.

Let's get back to sports. We noticed that during the climb you chatted often with Franco Ballerini, the cycling coach of the Italian national team. So it really wasn't that tough!
To be honest, I talked very little, and only in the few level stretches. As to the rest, I have to say that Franco Ballerini was always at my side along the most demanding stretches, and that's when I really appreciated his talkativeness… also because I wasn't capable of saying a word… who knows why!

Will Mapei Day be held again next year?
Given this year's success and enormous enthusiasm, I would definitely say yes. I hope it will become an annual event. To paraphrase Bartali's famous words, what I'd say about Mapei Day is that next year is certainly worth… "doing it all over again".