TRENCHLESS TECHNOLOGIES

ABOUT MM

MM Spa
is a leading Italian engineering firm specialized in the design and construction of public transportation infrastructure and urban redevelopment projects promoting the sustainable development of the local area.

Founded in Milan in 1955, MM is responsible for the construction of the city's entire metropolitan rail system - 108 stations and over 100 km of track - and for major traffic and hydrological engineering projects.

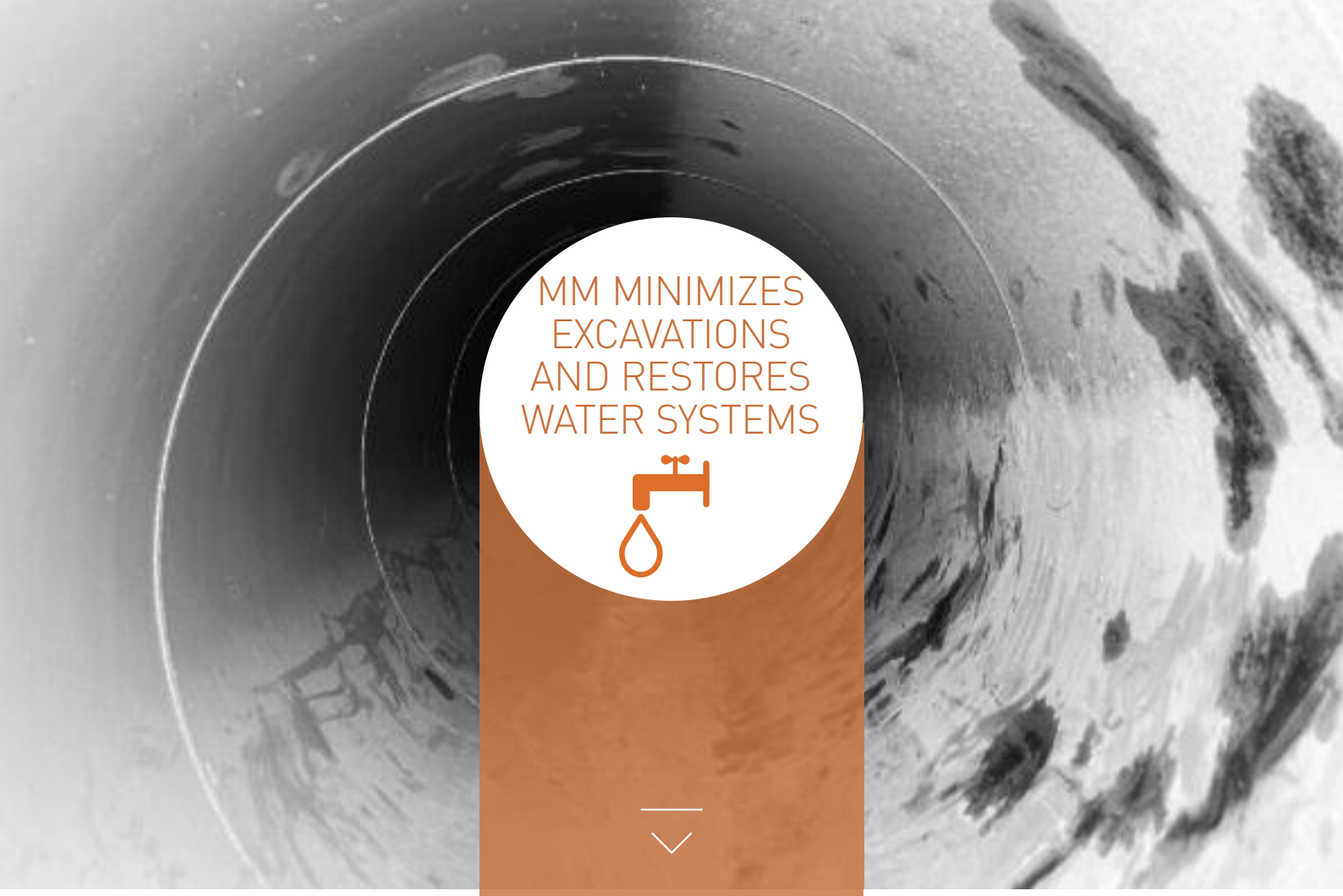
MM is now able to export the solid experience it has developed in this sector to other major projects throughout Italy and abroad. It has participated, for example, in the construction of the metropolitan rail systems in Naples, Rome, Brescia, Turin, Copenhagen and Thessaloniki, the light rail systems in Padua and Venice, and the Autostrada 35 (BreBeMi).

MM Spa offers services ranging from project design to technical and financial assessments, from preliminary characterization to work supervision, and from design validation to inspections, testing and quality control.

MM is now a business partner to public agencies on major public works, whose cost and complexity demand consolidated management capabilities and absolutely reliable technical and administrative support.

Since 2003 MM is also in charge of Milan's Water Supply Service, which includes abstracting, purifying and distributing groundwater, collection and treatment of municipal wastewater, and generally, planning maintenance and investments for the water supply and sewer systems.

In 2014, MM also undertook management of the real estate assets of the City of Milan, comprising over 38,000 subsidized housing units, parking garages and other facilities. To accomplish this, MM created the new organizational unit "MM Casa", which works alongside other company structures that are already managing city services.



MM MINIMIZES EXCAVATIONS AND RESTORES WATER SYSTEMS

Traffic in Italian cities is an increasingly critical issue: in addition to congestion and other problems associated directly with the excessive number of vehicles using city streets, there is also a series of environmental consequences such as gaseous and particulate pollutant emissions, noise pollution and social problems such as interference with commerce.

With the aim of helping to resolve one of the major factors associated with this issue, MM's approach is focused on lessening the inconvenience to circulation in the city caused by open excavations for various types of interventions, mainly maintenance of underground utilities, which may block sidewalks or streets.

The now well known innovative "no-dig" or "trenchless" methods for working on underground utilities and the General Urban Plans for the Management of Underground Utilities (Piani Urbani Generali dei Servizi del Sottosuolo – PUGSS, implemented by the Ministry of Public Works Directive of 3 march 1999) are two tools available to city administrators and water system operators to achieve improvement as regards this factor in urban traffic congestion.

In keeping with decisions by the Region of Lombardy (Deliberation of the Regional Committee no. 6630 of 19 July 2011 "Guidelines for the use and alteration of the subsurface", which extends and implements Regional Regulation no. 6 of 15 February 2010 "Criteria for drafting General Urban Plans for Underground Utilities and criteria for infrastructure mapping and georeferencing"), MM undertakes concrete actions using latest-generation methods.

MM is committed to using non-invasive technologies to minimize the need for excavations, making it possible to rehabilitate major sections of water mains and sewer lines while significantly reducing impact on traffic flow and bringing clear social and environmental benefits, especially in highly urbanized areas.

Trenchless technologies reduce handling of materials (for example, the transportation of excess excavated soil to a landfill), the circulation of heavy vehicles, the size and duration of the worksites, pavement removal, impact on traffic circulation, and interference with commercial, residential or recreational activities. Social and environmental costs may be reduced by 80% (source: TILab based on the environmental impact model developed by the Federation of Swedish Industries) and worksite accidents by 67% (source: Inail).

REFURBISHMENT TECHNOLOGIES

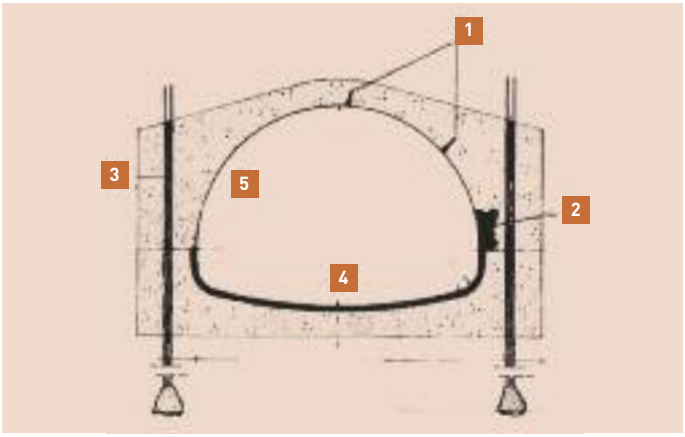
REFURBISHMENT TECHNOLOGIES FOR THE WATER SUPPLY NETWORK

- **Relining by means of dual-component resins** sprayed on the inner walls of pipes;
- **Relining by means of inserting Cured-In-Place Pipe (CIPP)**;
- **Relining by means of semi-structural Cement Mortar Lining (CML)** of steel drinking water delivery pipes by mechanized application of a layer of cement of constant thickness to the inner wall of the pipe;
- **Relining Slip Lining**: insertion of a PEAD liner in an existing pipe; the reduction in pipe inner diameter is partially compensated by a significant reduction in flow resistance.

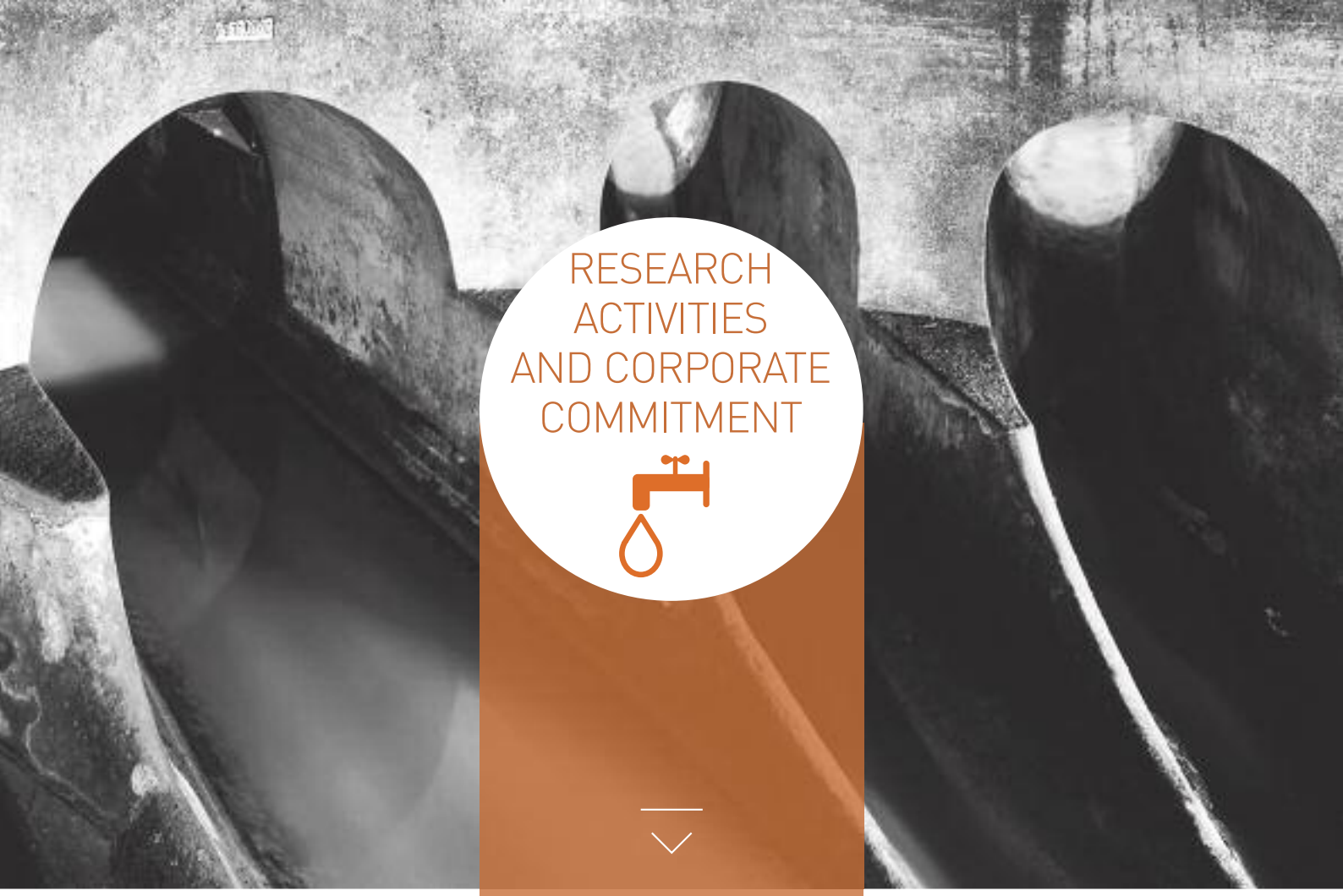
Cement Mortar Lining DN 1000

REFURBISHMENT TECHNOLOGIES FOR THE SEWER NETWORK

- **Consolidation of fiber-reinforced thixotropic mortar** (leak sealing **(1)**; pier foundation reinforcement **(2)**; micropiles **(3)** (Φ= 100 x 125 mm reinforced with steel pipe Φ= 75 mm); refacing of flow bed with grès tiles **(4)**; refurbishment of inner walls using shotcrete **(5)**;
- **Insertion of CIPP liners in pipes** (air inversion, water inversion, and UV polymerization).



MM is constantly increasing the amount of planned investments for this type of intervention in the Water Services Network. In 2016 projects using trenchless methods will surpass the traditional open excavation approach in number for the city of Milan water service networks.



RESEARCH ACTIVITIES AND CORPORATE COMMITMENT

Thanks to the competency it has developed in designing and executing trenchless services, and with the research support of the Politecnico di Milano (georadar, hydraulic modeling, static testing and inspections of network, assessment of corrosion of metal pipes, etc.), MM provides technical consulting services and takes part in regional and national committees in an effort to develop and promote legislation to better define, plan and execute works using a "no-dig" approach.

In particular, MM provides technical support to:

- **The Region of Lombardy** - Laboratory on the Subsurface, to lay out guidelines for the use and alteration of the subsurface ("Guidelines for Lombard Municipalities and Provinces for the Use and Alteration of the Subsurface", Regional Committee Deliberation no. 6630 of 19 July 2011, published in the official bulletin of the Region of Lombardy no. 30 of 25 July 2011);
- **The City of Milan** in the drafting of the PUGSS (General Urban Plan for the Management of Underground Utilities);
- **The Italian Association for Trenchless Technology (IATT)**, taking an active role on the National Commission for Pipe Refurbishment (Commissione Nazionale Risanamento Condotte) with the goal of proposing application guidelines and best practices to be encoded into UNI standards.

These guidelines and best practices will enable planners and awarding authorities to determine the most opportune intervention methods for each context and for the technical characteristics of the specific project. They will also allow companies in the sector to be recognized for their compliance with laws, regulations and standards and generally technical and managerial requisites that ensure professionalism and final products that meet the expectations of the clients. We mention a recent IATT publication, drafted with significant support from MM technicians, "Classification and legislative framework - Technologies for refurbishing and renovating network infrastructure that limit the use of traditional excavation methods (trenchless/no-dig)".

Slip Lining DN 400

Cured In Place Pipe

Water Service Planning and Strategy Office

Tel. +39 02 7747.740
Tel. +39 02 7747.865 (front office)
p.capogrosso@mmspa.eu

MM Spa
Via del Vecchio Politecnico, 8
20121 Milan, Italy
Tel. +39 02 77471
info@mmspa.eu
www.mmspa.eu
www.milanoblu.com

follow us on:

engineering experience