



IMPACT ENGINEERING

For Designing Climate Adaptive
Resilient Infrastructure



CUPOLEX[®]

**A More Flexible and Adaptive Approach
to Stormwater Management**



Converting Risk-Driving Impervious Spaces Into Resilient Assets

CUPOLEX®, with its proprietary engineered concrete structural design and applications, converts risk-driving impervious spaces into resilient assets. By engineering the geometry of concrete through the CUPOLEX® form-based approach, our design and engineering brings a unique set of additional performance functions to any construction project with limitless applications.

Next to cost-benefits for our clients, CUPOLEX® solutions bring a set of ecological, social, and municipal benefits by integrating risk-reducing functions, such as stormwater capture and management, structural soil cells for flood mitigation, and green infrastructure to combat urban heat.

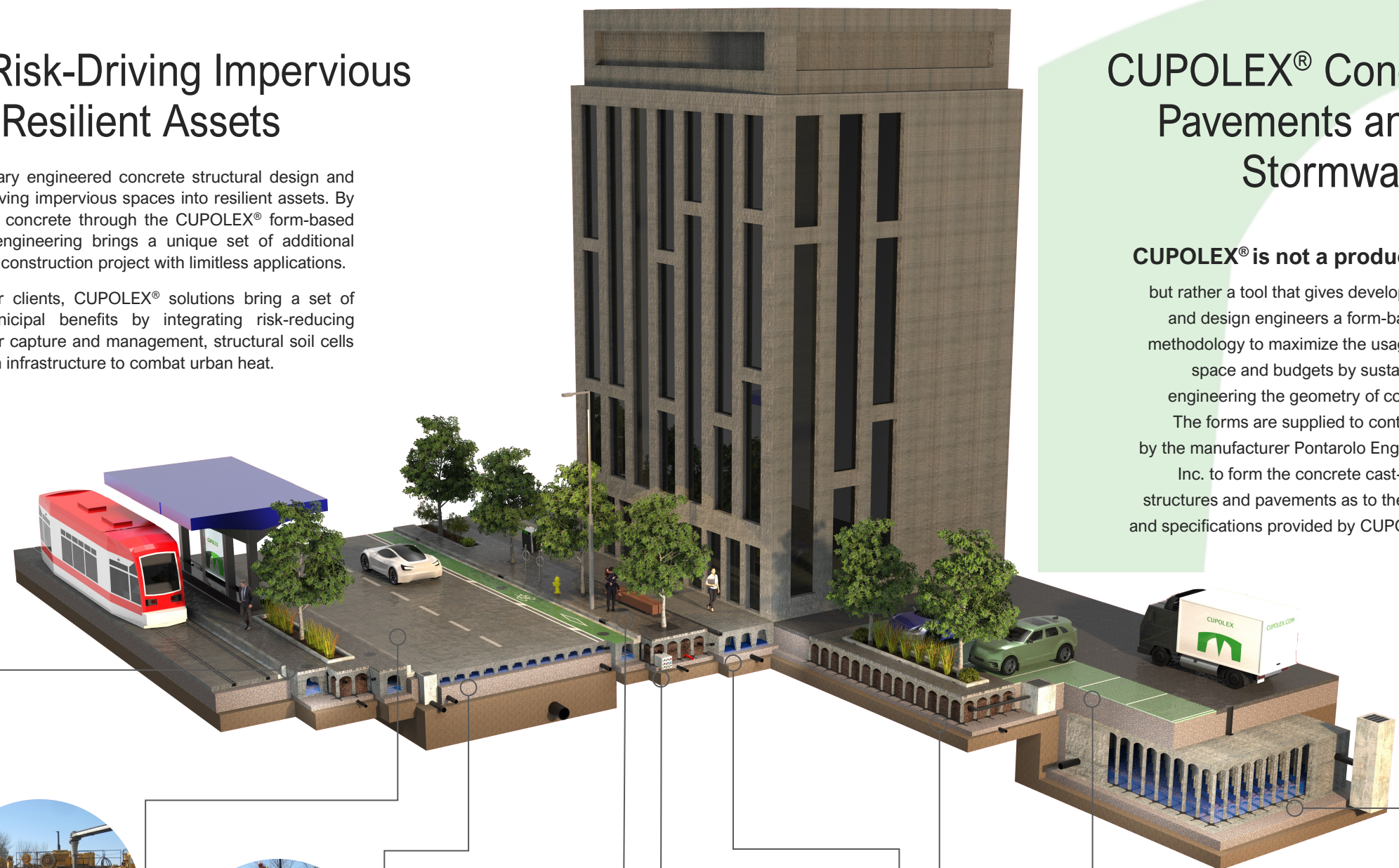
CUPOLEX® Concrete Cast-in-Place Pavements and Structures for Stormwater Capture

CUPOLEX® is not a product!

but rather a tool that gives developers and design engineers a form-based methodology to maximize the usage of space and budgets by sustainably engineering the geometry of concrete. The forms are supplied to contractors by the manufacturer Pontarolo Engineering Inc. to form the concrete cast-in place structures and pavements as to the design and specifications provided by CUPOLEX®.

Applications

- Detention
- Retention
- Harvesting
- Infiltration
- Cisterns
- LIDs
- Permeable Pavements
- Soil Cell Pavements
- Treatment
- Flood Mitigating Rigid Pavements



Isolator Rows
Incorporated in the design with closed bottoms to pre-treat run-off along with manholes for easy access and maintenance. They can be integrated into bike lanes, roads, and sidewalks before water enters the main CUPOLEX® cast-in-place concrete pavement chamber. The complete system can reduce TSS by up to 60-90% and water is treated naturally



Roads & Laneways
The resulting product is a concrete pavement slab, capable of providing carrying capacities equivalent to conventional road pavements, with less concrete required to do so. The ability of CUPOLEX® to reduce the initial construction costs of concrete road pavements makes them much more economically attractive to transportation agencies.



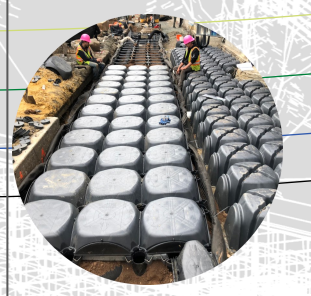
Rigid Pavements
Are designed for Stormwater capture to mitigate flood risk. This design converts impervious pavements into resilient assets but also extends the life of existing water infrastructure by reducing the hydrological load. Transforming urban impervious pavements in areas of flood vulnerability can now be done cost-effectively with much less interruption in traffic patterns and the local economy.



Soil Cell Pavements
A Cupolex concrete cast in place Soil Cell Pavement is a green infrastructure facility designed to provide stormwater management benefits equivalent to bio-retention or bio-infiltration. The void of variable depths provided is filled with filtration soil media. Stormwater is distributed and collected within the cell network and an underdrain is connected to a discharge point or storm sewer.



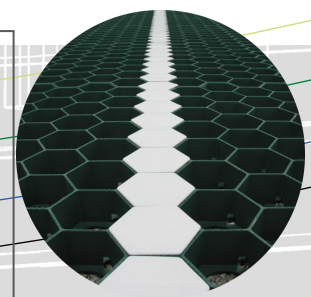
Utilities
The elevated CUPOLEX® concrete structure and the void created below the pavement is used to contain quality and unlimited soil volumes. Flexible for any dimension on plan or depth, CUPOLEX® can be easily installed around new or existing underground utilities and pavement penetrations. Any future utility retro-fits are easily cut out.



Hybrid Systems
Soil Cells Pavements designed as Hybrid Systems combined CUPOLEX® stormwater capturing pavements and structures. This cast-in-place concrete stormwater management system is designed with integrated stormwater capture, retention, infiltration and treatment as a stand-alone system.



High Load-Bearing
The elevated CUPOLEX® pavement is supported by the matrix of concrete columns formed by the CUPOLEX® forming system. The paving loads are transferred vertically down to the subbase below the planting soil layer, allowing the pavement to support high load-bearing capacities. Applications include sidewalks, right-of-ways, parking areas, plazas or other public realms including above structural decks and roofs.



LID
CUPOLEX® concrete structures provide green solutions for total Stormwater Management when designed with a PRATEX® permeable grid or pavers and a leveling base above the CUPOLEX® structure. Water is filtered from the surface down to collection in the CUPOLEX® concrete structure for controlled management. This design removes TSS by as much as 60-90% via the permeable surface paving and Isolator Rows with manhole access for easy maintenance.



Detention
CUPOLEX® concrete structures provide cost-effective solutions for site applications where stormwater needs to be detained and discharged at a controlled rate. Detention structures are designed for superior performance and allow for maximization of developable land. Placed efficiently and easily under parking lots with deep cover or no cover at all, as well as in non-traffic areas and building foundations.



URBAN RESILIENCE RESILIENT INFRASTRUCTURE SUSTAINABLE CONSTRUCTION

Designing Climate Adaptive Resilient Infrastructure

We identify areas where contemporary challenges call for improved collaborative urban flood management

CUPOLEX® is the leading global manufacturer of concrete cast-in-place forming solutions for stormwater management and flood protective design measures that are climate change resilient. Our design and engineering approach brings a unique set of additional performance functions to any project with limitless applications. Next to cost-benefits for our clients, CUPOLEX® engineered concrete design solutions bring a set of ecological, social, and municipal benefits by integrating risk-reducing functions, such as:

- Decreasing GHG emissions
- Storm water capture
- Sustainable pavements for flood mitigation
- Soil cell pavements supporting green infrastructure to combat urban heat
- Vapour intrusion mitigation for developments on challenging and environmentally impacted properties
- Converting risk-driving impervious spaces into resilient assets

CUPOLEX® design solutions include Urban Resilience, Resilient Infrastructure and Sustainable Green Construction.

CUSTOMIZED DESIGN

Cupolex offers structurally sound and customized design options for civil engineers, planners, municipalities and developers for their specific needs or to creatively integrate resilience in their design plans.

- Capturing large quantities of storm water, infiltrating or optimizing green infrastructure for flood mitigation and reducing urban heat,
- Slow down run-off to prevent storm drain overload, a groundwater recharge system for low-impact developments (LIDs),
- Stormwater Treatment system to treat water quality, or a complete Stormwater harvesting system.