# RICERCHE PRELIMINARI

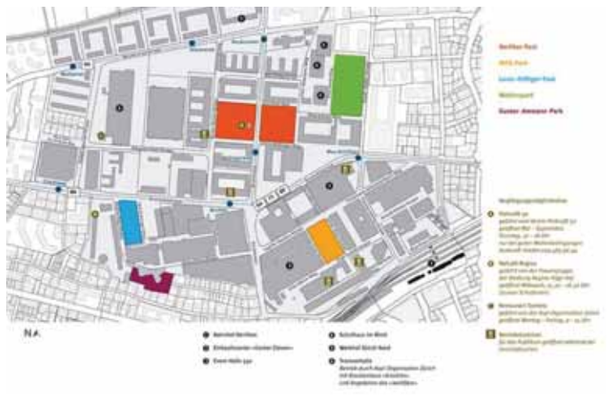
## green industry

In imagining new designs for Roncajette Park, it became clear that there were opportunities to make changes within surrounding land uses, and in particular to properties within ZIP.

ZIP has expressed interest in developing and experimenting with a sustainable production area model. The Sustainable Industry Area Model (SIAM) initiated through the European Union serves as an organizational and policy model for sustainable development.

Sustainable industry integrates economic, social, and environmental issues and seeks improvements for all three. Necessarily, fulfillment of these goals requires partnerships between local authorities, citizens, and industry.

This research demonstrates examples of sustainable building, landscape, water, and energy practices that have been successful elsewhere in the world. The concepts shown here could be applicable to ZIP's current properties as well as any future ZIP industrial developments.



mfo park, zurich switzerland

industrial renovations

interior view

green structures: artist's rendering

## green roofs

One of the biggest ecological impacts of industrial land use is the hardening of the landscape. In typical industrial zones, rooftops, roads, and vast expanses of paving impede percolation of rainfall into the soil. As a result rainfall washes off these impervious surfaces at a rapid rate, flooding pipes and canals, contributing to erosion, and accumulating pollution (e.g. oils, greases, heavy metals) as it flows. In response to this "runoff" problem, numerous architectural and landscape solutions have been developed to slow down the rate of flow and to absorb this excess water.

Green roofs, also known as "living roofs" or "eco-roofs," can be installed on building rooftops during routine renovations. Recent advances in their design allow green roofs to be very lightweight, with structural soils that also hold rainwater. Plants on the rooftops provide the function of evapo-transpiration, sending water back into the atmosphere.

ford rouge river plant
detroit, michigan, united states

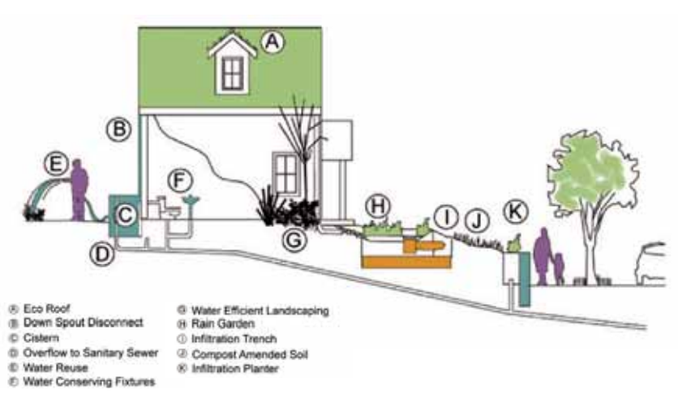
green roofs reduce stormwater runoff and moderate climate in buildings

green roof habitat

green facades: plants grow on vertical surfaces

## water collection

Water collection systems include decorative cisterns, rain-barrels, fountains, and pools, which provide water storage for uses such as cooling of equipment and irrigation of green spaces. Further, they reduce reliance on clean drinking water supplies and help reduce flooding. Extensive evidence exists of successful small-scale water catchment projects. The "reinvention" of ZIP is an opportunity to develop innovative rainwater storage systems.


## green streets & parking

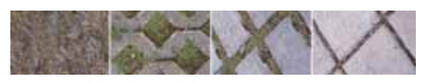
Streets and parking lots can be designed to include infiltration areas and vegetated surfaces. Pervious pavement and porous pavers can be used instead of asphalt and concrete. Another common strategy is to use open grass-lined or vegetated drainage channels in the place of storm drains and pipes; these landscape features are known as "bioswales."

When stormwater runoff comes in contact with soil and vegetation, pollutants that are bound to sediments carried by the water attach to plant roots and surfaces and are captured before they flow downstream or into the pipe network. Microbes in the soil also aid in water quality improvement by digesting oils and greases.

curb cuts define planting edges in parking lots and allow water to flow into bioretention areas



curbless street and bioswale
water retention system



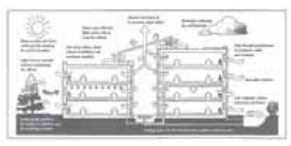
green parking lots with porous pavement

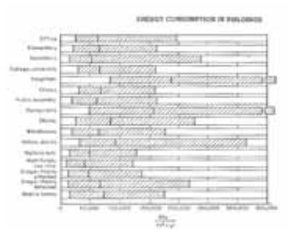
## solar energy

Incorporating renewable energy sources is a key component of converting to sustainable industry. Solar energy can be used to power equipment, heat and cool buildings, and heat water. The examples to the right include industrial-scale projects that reduce reliance on petroleum products for energy by harnessing the power of sunlight.

solar panels combined with green roofs, berlin, germany

solar thermal collectors for hot water, heizhaus-lienz, germany

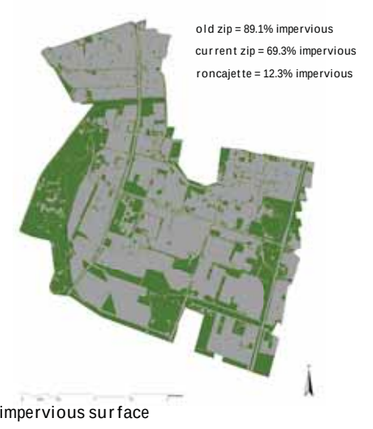




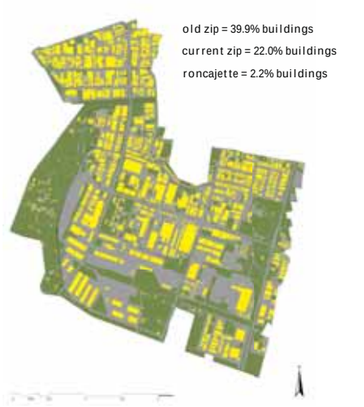
pompeu fabra library, barcelona, spain
solar panel facade

## zip analysis

Our research included an analysis of the built and non-built area within the current ZIP properties. We first analyzed the percentages of built space versus open space. Next we separated buildings from other impervious surfaces (such as roads and parking lots). Finally, we categorized different types of roofs within ZIP in order to determine their potential for conversion to green roofs, water collectors, and/or solar collectors.




zip - impervious surface




zip - buildings


zip - roof types

## zip proposed...

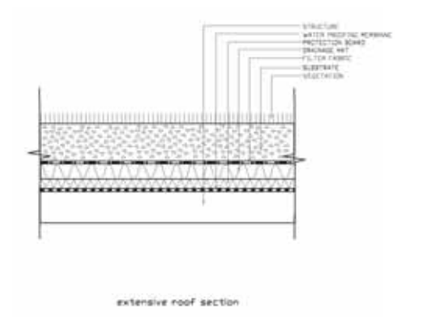
A combination of green roofs, structures for water collection, and solar collection devices such as photovoltaic panels and solar hot water heaters would greatly reduce ZIP's dependency on fossil fuels and reduce the ecological impacts of its industrial practices. The graph to the far right compares amounts of roof runoff during a storm. Green roofs significantly reduce runoff compared to conventional flat rooftops. Extensive green roofs are lightweight and attractive, and help to regulate the climate inside buildings.

Many of these proposed solutions are becoming common elsewhere in Europe and around the world. By re-thinking the way ZIP buildings and landscapes function, ZIP can make valuable contributions to the environment and community in Padova, and become a global leader in sustainable industry.

zip - aerial view of potential new roof uses

zip - aerial view of potential new roof uses

living roof example




# PADOVA E IL PAESAGGIO: Scenari Futuri per il Parco Roncajette e la Zona Industriale

Arthur Adeya, Charlotte Barrows, Ashley H. Bastow, Pippa Brashear, E. Susan Chamberlain, Keith Cinami, Marisa Fort Spear, Stephanie Hurley, Young Min Kim, Ilana Liebert, Lauren Lynn, Varna Shashidhar, Jennifer Toy
Professore Carl Steinitz, Juan Carlos Vargas-Moreno, Laura Cipriani