

# urban drainage - our solutions



## SUSTAINABLE URBAN DRAINAGE SYSTEMS

Our climate is changing affecting rainfall intensity and patterns. More urban areas have to cope with larger quantities of water. Often drainage systems are not designed for these increased water quantities. This could cause serious damage and endanger public health.

Sustainable urban drainage systems (SUDS) that collect and transport rainwater run-off, are one of the most significant developments in storm water drainage design in recent years. Our scientists, engineers and policy specialists offer advice on a range of methods tailored to suit the unique challenges each drainage project brings, providing an integrated solution that ensures our drainage systems are sustainable and maintain the design objectives of water retention and run-off quality.

### Manage your urban drainage system

Royal Haskoning provides services that cover the whole project life cycle, from concept to feasibility, impact assessment, design, tender process, site supervision and operation & maintenance. Specific products and services are:

- Hydrological & Hydraulic Modelling and Analysis
- Design of Structural Measures for drainage and sewage systems
- Monitoring and Early Warning Measures
- Geographical Information Systems (GIS)
- 3D visualizations
- Flood Risk Assessments
- Economic & Institutional Analysis
- Environmental & Social Impact Assessments
- Process Management
- Education and Training



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## Multipurpose solutions for urban drainage

Improving urban areas against the impact of future climate change becomes a major challenge for all cities around the world. One of the solutions: a sustainable urban drainage system (SUDS) taking into consideration water quantity, water quality and demands from environment and society.

### Water quantity

Increasing the drainage capacity of a sewage system is the most typical solution in urban drainage for solving water quantity problems. By doing this the problem is transferred downstream. Therefore, to avoid such problems our systems first retain the water, then store the water and only then discharge the water in a controlled manner.

### Water quality

We design dual systems, which transport sewage separately from rainfall run-off. We integrate our drainage systems with the collection and treatment of industrial and domestic waste water, to minimize the contamination of effluent towards the surface water. By flushing the surface water we prevent the development of diseases and blue-green algae.

### Environment and society

Which environmental conditions are present locally as well as in downstream areas and should be considered to design an effective system? Furthermore, what are the demands from the local population and the wider society and how can these be integrated to ensure their safety and prosperity? Royal Haskoning has extensive experience with the implementation of environmental and social assessments and knows the importance of stakeholder consultations.

### Innovations by Royal Haskoning

To support governments and water boards in the sustainable improvement of urban drainage systems Royal Haskoning has developed innovative tools, e.g.:

- Digital Water Portal – Residents can use this portal to ask questions and send complaints to local authorities.
- Urban Drainage Risk Map – Integration of all aspects of drainage into one risk map.

These tools have proven to be effective for policymaking and investment planning.

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