WATER
CAPABILITIES IN ASIA
Arcadis is a global natural and built asset design and consultancy firm working in partnership with its clients to deliver sustainable outcomes that help to improve the quality of life. Through the work we are doing, we are helping our clients to address the toughest water based challenges ranging from rising tides and poor infrastructure, to land subsidence and industrial waste water solutions.

We have a long history developing and innovating water solutions that can be traced back to the Association for Wasteland Redevelopment in the Netherlands in 1888. This level of experience combined with our innovative expertise has ranked us number two in world (ENR 2017) for providing clear sustainable water solutions.

Our dedicated team has worked on some of the world’s most iconic water based projects enabling them to innovate pioneering water treatment, built water, rectification and management solutions.

Our multidisciplinary approach integrates in-house expertise, enabling scalability and operational efficiency, which has been demonstrated on projects such as Wuhan’s sponge city program, Kaliwa’s water supply scheme, Singapore’s deep tunnel sewerage system and Hanoi’s red river urbanization development.
“WITH A GROWING GLOBAL FOOTPRINT, WE CONNECT CLIENTS TO MORE THAN 3500 WATER PROFESSIONALS FROM ACROSS THE WORLD”

A RAPIDLY CHANGING ENVIRONMENT

Rapid urbanization, growth in industrial activity and migration is creating an Asia wide need to readdress the way we manage water.

Water is one of the most important resources and supports economic, urban and social development. In Asia, the need to develop sustainable water solutions is being impacted by core factors such as climate change, rising sea levels and ageing infrastructures. Asia’s water challenge is also highlighted by the shortage of clean and reliable water source, as well as the lack of holistic planning that addresses water resiliency.

As a result, businesses and water bodies across Asia are looking to build sustainable solutions. To achieve this, it is important to understand that every challenge is unique and requires an in-depth knowledge across the entire water cycle, from planning through to rectification.

To overcome today’s environmental challenges, Arcadis provides future-proofed solutions using a multidisciplinary approach that combines our global and local expertise.

STRATEGIC PARTNERSHIPS

Through our Shelter program, Arcadis and UN-Habitat, the United Nations agency for human settlements, have partnered since 2010 with a common goal: to improve the quality of life in rapidly growing cities around the world. We commit our employees, our expertise and skills to help bring the UN-Habitat mission to fruition.

Arcadis is a platform partner to 100 Resilient Cities initiative, pioneered by the Rockefeller Foundation. Arcadis is committed to help cities around the world to navigate towards a more resilient future through supporting the transition from their resilience strategy to implementation.
WHAT WE DO

We provide sustainable and full-cycle water solutions

From rising tides, droughts to polluted reservoirs and broken pipes, the challenges faced in managing and distributing the world’s water are vast. Without effective systems and quality infrastructure the consequences for our communities across the world would be unthinkable.

Thanks to centuries of experience in the water sector, our specialist teams of engineers, scientists and consultants are uniquely positioned to provide safe and secure solutions. Everything we do is built to withstand the demands of a rapidly changing world.

We partner with industry leaders to help ensure our final product is compliant to the highest international standards. Our processes deliver clean water and prevents the spreading of disease, contamination and pollution, creating a sustainable water supply.

Partnering with governments and businesses to deliver smarter and more resilient solutions that protect their water supplies as well addressing the impact on the environment, infrastructure and operations.

WATER VALUE PROPOSITIONS

Through our wealth of experience in the water sector, we are able to provide an unrivaled level of expertise that is uniquely positioned to develop safe and sustainable water solutions throughout the water cycle.

Arcadis offers a multidisciplinary proposition and capabilities to cover resiliency, quality and efficiency in each and every project we service.

Our unique approach provides a robust solution that adds value for our client’s project.

**RESILIENCY**

We provide comprehensive coastal and delta city management including flood risk management, eco-system restoration and climate change adaptation, all designed to provide resilience through risk of flooding, storms and environmental change.

**COMPLIANCE**

We partner with industry leaders to help ensure our final product is compliant to the highest international standards. Our processes deliver clean water and prevents the spreading of disease, contamination and pollution, creating a sustainable water supply.

**EFFICIENCY**

Partnering with governments and businesses to deliver smarter and more resilient solutions that protect their water supplies as well addressing the impact on the environment, infrastructure and operations.

CAPABILITIES

**Water Supply and Treatment:**
Using leading-edge digital technology, we can create solutions to address the complex process of clean, quality water supply, treatment and sustainable access.

**Water Management:**
With our long-standing knowledge of water management, we can deliver expertise around flood defenses, safety and adaptability.

**Industrial Water Solutions:**
Working with industrial clients we improve water efficiency by optimizing consumption in the manufacturing process making the businesses more sustainable and cost-effective.

**Conveyance and Network:**
We have the expertise to enable efficient solutions around managing the sustainable movement and storage of water and wastewater.
CHALLENGE
Cyclone Nargis in 2008 demonstrated the vulnerability of the Ayeyarwady Delta in extreme weather conditions. With the Ayeyarwady River as the “life-vein” of the country, the Myanmar government recognized the need for integrated water management and implemented the Integrated Ayeyarwady Delta Strategy (IADS) IADS project – Ayeyarwady Delta Masterplan.

SOLUTION
The IADS project is the first of its kind, and Arcadis led a consortium of numerous stakeholders including institutions, ministries in the region and representatives of NGOs to develop the Delta Atlas and Delta Strategy. The Atlas is a capacity building tool, structured to understand the relations between human activities, governance, land-use, physical and ecological delta conditions. Aside from the Atlas, Arcadis also provided a toolbox of potential measures and an Integrated Strategy, developed in cooperation with the Myanmar government.

OUTCOMES
The Delta Masterplan will eventually prevent the threats of climate change such as peak flows and river discharges cause by frequent flooding, and water shortages during the dry season. It will improve quality of life for the community through balancing the socio-economic development of the delta area, the sustainable use of natural resources, and ensuring the prevention of water related risks.
CHALLENGE
With over 12 million residents and one of the most populous cities in Central China, Wuhan is working hard to deal with water stress, water balance and reserve of water. The location of the city, in a large plain, makes Wuhan extremely vulnerable to flooding due to intense rainfall.

SOLUTION
Arcadis was the principal consultant by Wuhan Water Authority to provide technical, policy and advisory solutions for its Sponge City program. Wuhan is the first of 16 cities in China to launch the Sponge City project aimed to build and develop a new central water infrastructure that can store, rectify and manage water sustainably.

OUTCOMES
The name Sponge City refers to the innovative solution to create more green public spaces to absorb storm water, making the city more permeable and resilient to climate change. Arcadis taking a multidisciplinary approach was able to design a solution to help Wuhan manage 60% of the rainwater - providing a clean source of water, protect against flooding, land subsidence, spreading of disease by controlling the quality and flow of water that enters a city. As the number of Chinese cities affected by floods has doubled since 2008, the Sponge City approach will improve the quality of life for many in China.

CASE STUDY | CHINA

WUHAN SPONGE CITY

Creating a sustainable city infrastructure to hold, clean and drain water, using an ecologically-friendly approach

KEY OUTCOMES

- 20% of Wuhan to be constructed according to the Sponge City criteria by 2020
- 80% by 2030

CAPABILITIES:

- Technical support, policy and advisory solutions

Arcadis Asia – Water | 6
CHALLENGE
Arcadis has been working on developing Guwahati’s urban and water infrastructure programme, the first of 20 cities targeted to launch a Smart City Initiative in India.

SOLUTION
Arcadis provided a combined solution across three areas:

- An integrated technical analysis of water quantity and quality to determine the required scope of work;
- Preliminary design work with the use of virtual reality and 3D design;
- Analysis of river profiles to ensure structural safety of the embankment.

OUTCOMES
The project will look at the implementation of a 6km sustainable river front along the Brahmaputra river, an area that is prone to flooding. In addition, improvements to the city’s drainage, implementation of sewage treatment and design of Deepor Beel, the major lake of the city, will contribute to obtaining a smart, aesthetic and safe Guwahati that benefits its residents for many years to come.
The Thames Tideway Tunnel will upgrade London’s sewerage system to cope with the growing population demands of the city. A highly significant development for the City of London, Thames Tideway Tunnel is the UK’s biggest water infrastructure project, and the first to be delivered under the new Special Infrastructure Project (SIP) regulations. It will be essential in preventing millions of tonnes of sewage overflowing and discharging into the River Thames every year and instrumental in keeping the Thames clean.

Arcadis was appointed by Thames Water to perform due diligence testing for the project, thereby playing a vital role in assessing the health of the scheme on behalf of new funders being sought by Thames Water. With the massive scale of the project, the scheme demanded, seamless blending of skills from Arcadis’ global network.

The 25 kilometer tunnel will connect with 34 of the most polluting overflow points along the river, collecting sewage that currently overflows into the Thames and transferring it to Beckton, east London, for treatment. The project will future-proof Thames against environmental factors, providing a cleaner, safer river for all to enjoy.

CASE STUDY | UNITED KINGDOM

THAMES TIDEWAY TUNNEL

Preventing millions of tonnes of sewage overflowing and discharging into the River Thames in United Kingdom every year

CHALLENGE

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CHALLENGE
As a thriving urban coastal city, New York is vulnerable to the effects of rising sea levels and climate change. The disastrous effects of storms such as Hurricane Sandy caused over $19 billion damages in Manhattan alone - the New York Stock Exchange closed for a week, neighborhoods and business were ruined and transportation systems, such as parts of the subway, flooded. These shocking effects brought to the forefront New York’s vulnerability to coastal flooding on its unprotected coastline and its need for resilience. To prevent further devastation and a ripple effect across the global economy, the US Department of Housing and Urban Development (HUD) brought together the best and brightest, and appointed Bjarke Ingels Group (BIG), Arcadis and partners to design resilient infrastructure in New York Cit.

SOLUTION
The winning solution, “The Big U” aka the Dryline, will envision a protective system around Manhattan, the first step to a resilient New York City. Arcadis and partners developed feasibility and conceptual design reports to provide flood protection and social infrastructure to benefit millions who live, work and visit there.

OUTCOMES
The city has created a more resilient New York City through flood protection and social infrastructure to protect over 200,000 residents, and 21,000 business in the area. Additionally, the project delivered a range of multifunctional solutions integrated with neighborhoods and community amenities, improving access, expansion of parks and recreational spaces.

KEY OUTCOMES

- **2.4 miles** of protection
- **200,000** residents to be protected
- **21,000** businesses to be protected

CAPABILITIES:

- Engineering design of flood protection and modeling

CASE STUDY | UNITED STATES

THE BIG U

EAST SIDE COASTAL RESILIENCY

Strengthening Manhattan’s coastal defences to improve the city’s resiliency to severe weather events
CASE STUDY | QATAR

WATER SECURITY

MEGA RESERVOIRS

Providing strategic water storage solutions for one of the world's largest reservoirs in Doha, Qatar, Middle East

CHALLENGE
Between now and 2030, the number of people living in Qatar is expected to rise to 2.3 million. Recognizing the growing demand for water, our client Qatar General Electricity & Water Corporation, KAHRAMAA, developed an ambitious mega reservoir project with the aim to increase water storage capacity from <2 days to 7 days (or 30 with rationing).

SOLUTION
Arcadis provided a solution across 5 mega reservoir sites to construct network pipes to connect their existing desalination plants and transmission networks. Over 650km of pipes were installed, allowing for bulk storage to support the high demand of water amounting to 15 million metre cube of potable water storage.

OUTCOMES
Arcadis delivered all civil and structural design, and provided hydraulics and hydrodynamic works for the wider system to ensure the water complies with the World Health Organization standards. As a result, we helped to improve the quality of life for Doha's people and businesses ensuring an efficient, secure and flexible water supply for the future.

KEY OUTCOMES

- 5 mega reservoir sites
- 7 days full water storage
- 650km of pipes to be installed
- 15,000,000 metres cubed of potable water storage

CAPABILITIES:

- Civil and Structural Design
Throughout Asia we have delivered some of the most innovative and world-leading water solutions.

Deep Tunnel Sewerage System, Singapore
Water Conveyancing | Design and Engineering

Wastewater Management, China
Wastewater Treatment | Expansion Concept Design

Wastewater Management, Philippines
Data Analysis | Concept Design

Conceptual Design Amaravati, India
Flood Risk Analysis | Conceptual Design

Harbour Area Treatment, Hong Kong
Blasting Assessment | Design and Engineering

Development of Sewerage System, Philippines
Water Quality Analysis | Economic Analysis

Wastewater Treatment Evaluation, China
Technical Advisory | Project Manager

Harbour Area Treatment, Hong Kong
Blasting Assessment | Design and Engineering

Red River Development, Vietnam
Master Planning | Water and Infrastructure Design

Manufacturing Active Plant, Taiwan
Integrity Assessment | Leak Detection

Feasibility on BNAQ Assessment and Rehabilitation, Philippines
Hydraulic Assessment | Feasibility Assessment

Water Treatment Sludge Management, Philippines
Risk Assessment | Data Gathering

Wastewater Management, China
Wastewater Treatment | Expansion Concept Design

Conceptual Design Amaravati, India
Flood Risk Analysis | Conceptual Design

Water Balance and Lead Detection Study, China
Water Conveyancing | Design and Engineering