The green panache on our logo symbolises our achievement in creating green technology to enhance sustainability in buildings.

“ ‘Being green’ is a concept that we’ve applied to our work since the day we started, except that it was simply called technical and cost efficiency,” says Colin Thoms, CEO. “We are now bringing our green concept to the next level in the international stage after our solutions are recognised by professionals and governing bodies around the region.”

Fast Flow solutions form part of the Green Mark Assessment Criteria and are recognised by the Singapore Building and Construction Authority (BCA).

Marina Bay Sands Integrated Resort, Singapore
Architect: Moshe Sadie & Aedas Architects
drained by Fast Flow Siphonic System

... the art of drainage

Since the introduction of the siphonic roof drainage technology into Singapore in 1993, Fast Flow has provided unique solutions for more than 20,000,000sqm of roof area across Asia Pacific including some of the most iconic buildings on earth.

Every project completed by Fast Flow is a testament to our belief that drainage is as much an art as it is a science and that each client, each project and each market requires unique attention to develop each solution that brings out the beauty of architecture and functions with efficiency & reliability.
Introduction...

Siphonic roof drainage technology is a hydraulic engineering exercise that ensures and controls the formation of pressure inside the pipe system, and achieves very high drainage capacity.

Siphonic systems are designed based on the principle of full bore flow. With Fast Flow, clients enjoy the array of benefits that can be achieved with siphonic systems. This includes rainwater pipes travelling long distance without any gradient to the pipe work, sizes and number of rainwater pipes significantly reduced, water depth in the gutters significantly lowered to allow precise engineering and many more.

Fast Flow Siphonic System combines creative design with precision hydraulic engineering to provide innovative solutions to any roof drainage requirement.

The fundamental of siphonic engineering is the Bernoulli Energy Equation

\[ \frac{P_1}{\gamma} + \frac{v_1^2}{2g} + h_1 = \frac{P_2}{\gamma} + \frac{v_2^2}{2g} + h_2 + \Sigma h_L \]

The natural hydraulic head due to the height of the building provides the energy necessary for the transportation of water from one point to another. Detail analysis is done on head losses, velocity and pressure in the system to ensure proper functioning of the siphonic system, as well as ensuring different sections of a siphonic system is properly balanced. Our in-house proprietary design software FastFlowCALC© (certified by TÜV SÜD PSB Corporation) is proven to ensure balanced and high performance solutions with safe level of protection life in every project including some of the most distinctive roofs and structures in the world.

Beijing National Stadium
- Bird’s Nest, China
Architect: Jacques Herzog and Pierre de Meuron
drained by Fast Flow Siphonic System
The formation of different flow patterns and finally full bore flow within a siphonic system is a natural process in a correctly dimensioned siphonic system. A properly designed siphonic system achieves the full advantage of pressure flow without any external energy source and any moving mechanical parts.

Flow pattern 1: Wavy Flow
During initial and final stage of rainfall with minor rain, flow pattern inside the siphonic system has similar characteristic as the gravity flow system, i.e. non pressure flow.

Flow pattern 2: Pulsating Flow
As the rainfall increases, hydraulic plugs starts to occur inside the pipes. Minor sign of pressure can be observed in the system.

Flow pattern 3: Plug Flow
Further increase of rainfall causes multiple hydraulic plugs inside the pipe transforming flow pattern into pressure flow.

Flow pattern 4: Bubble Flow
Water rapidly fills up inside the pipes. Despite presence of air bubbles, system achieves stable pressure flow.

Flow pattern 5: Full Bore Flow
System achieves optimum functional capacity when the pipe is fully filled with water and reaches full bore flow.
Gravity System

Gravity rainwater outlets cause deep water depth above roof top creating problem on loading and leakage

...or require deep roof gutters

Large diameter gravity rainwater downpipes are difficult to conceal and waste valuable floor areas

Siphonic System

Shallow and controlled water depth on roof top and gutters

Small diameter siphonic rainwater pipe can be flexibly located and concealed

Small diameter and flexible pipe works without gradient enable ease of coordination with other services

Horizontal siphonic drainage pipes do not require gradient, minimise usage of ceiling space and maximise head room

BUILDING DRAINED USING GRAVITY SYSTEM

BUILDING DRAINED USING SIPHONIC SYSTEM

ADVANTAGES OF SIPHONIC ROOF DRAINAGE TECHNOLOGY

Johor Bahru Sentral Railway Station, Malaysia
Architect: Arkitek MAA
drained by Fast Flow Siphonic System
Piccolo™ Series Siphonic Outlets
Siphonic outlets specially designed to work with small gutters (200mm wide). Ideal for canopies, eaves gutters and small roof areas.

Primo™ Series Siphonic Outlets
Complete range of siphonic outlets ranging from 5 l/s to 150 l/s comes with specialised adaptors for installation on all type of roofs and gutters. Fast Flow Primo™ series siphonic outlets are specially designed to minimise any forms of blockages resulting from debris or fallen leaves collected on the roof top.

Heavy Duty Siphonic Outlets
Heavy duty siphonic outlets specially designed for drainage of car park roofs and driveways.

Fast Flow Pressurised System
Fast Flow’s patented technology enables linking of gravity/siphonic side branches into a pressurised stacks achieving high capacity while preventing back flow. Ideal for buildings with balconies and multi-storey carpark drainage. Refer to Fast Flow Pressurised System brochure for more details.

Rainwater Harvesting System
Complete rainwater harvesting system including siphonic outlets, pressure pipes, and the only filter system that is designed to work with siphonic systems.

Artecto™ Series Architectural Siphonic Outlets
Wide range of siphonic outlets designed to fit perfectly with the architectural finishing of terraces and balconies, combining the high capacity of siphonic roof drainage system with aesthetics.

Landscape / Green Roof System
Specialised landscape/green roof outlets are designed to provide proper interface with different green roof construction, filter and drainage systems.

Systems and Products...
Intelligent Design...

With Fast Flow siphonic system, we bring out the beauty of a building’s design rather than work against it. Fast Flow combines intelligent design and precise engineering, so clients can reach new frontiers in architecture.

Over the years, Fast Flow has applied this technique to a wide range of building projects, from single-level compounds to the highest business and residential towers. Every project completed by Fast Flow achieves the exacting specifications and derives the premium value of cost savings, green building lifecycle, unique architecture and engineering fulfillment.

Example of multiple linkages to a single stack

Example of how rainwater pipes can be designed to integrate seamlessly to a canopy design
Delivering Benefits...

Elegance
Fast Flow solutions characterise right customisation, minimal pipe work and flexible use of materials that enable freedom in creative design of drainage so as to complement the architecture and engineering of any structure, preserving the elegance even during a harsh environment. (1)(3)(5)(6)

0-Gradient
Fast Flow solutions fully optimise lateral pipe lengths without gradient to achieve efficient use of ceiling headroom by freeing up extra valuable building space. (2)(12)

Space Saving
Leveraging on small diameter pipe work, Fast Flow solutions provide flexibility in pipe locations and free up crucial space of a building. (3)(6)

Design Freedom
By easing tight space shared by all services, Fast Flow siphonic system bring forth flexible pipe work configurations for design freedom and improved buildability of unique architecture. (1)(5)(11)

Multiple Materials
Fast Flow solutions maximise the efficient use of multiple materials that enable a single siphonic system across any structure demanding different materials at different locations. (4)(5)(7)(8)(12)

Rainwater Management
Fast Flow siphonic system exhibits flexibility in managing rainwater design for all types of roof and buildings through creative design and engineering. (4)(5)(7)(8)(12)

Rainwater Harvesting
Fast Flow siphonic system allows various outlets to combine into single system and transport water through long distance without slope, making it the ideal transportation tool for rainwater harvesting. (4)

Landscape Drainage
Fast Flow siphonic system enhances the efficiency and aesthetic of the network drainage connection, creating elegant landscape and effectual green roof. (10)

Eco-efficient
Siphonic system uses smaller and less pipe work. This means less materials are required to build the rainwater management system in the building, achieving minimal use of resources in green building lifecycle.
Fast Flow Assurance...

Fast Flow is committed to continuous R&D programme with scientific consistency and rigour to sustain our product innovation, system integration, breakthrough in design and technology leadership in almost all the markets we participate. Fast Flow has a complete test rig in Singapore for our research and development team who are continuously at the forefront to create innovative drainage solution to suit the increasingly sophisticated architecture in buildings. All Fast Flow systems are fully tested and validated by the relevant authorities and governing bodies.

For system installations, we have our dedicated team of well-trained staff who are committed to deliver on schedule and work under strict safety condition. All our engineers and personnel undergo intensive training programmes and constantly upgrade their technical, design skills and knowledge to provide our customers with the highest quality of service and support.
Fast Flow is an effective organisation on the leading edge of drainage solutions. Through our robust operating model, competent people and continuous improvement, Fast Flow engages and connects with our clients with sterling outcome for every project we participate. Our iconic track record and progressive growth across segments and geography are achieved through our tireless effort to understand and fulfil the unique requirements of each client, each project and each market leveraging on our deep knowledge and proven methodology.

With us, you are in safe hands.