

Fast Flow – Setting new Olympic Standards

Colin Thoms

Late last year, Fast Flow won one of its most important races. The race to win the Beijing 2008 Main Olympic Stadium. This stadium is already famous worldwide and it is just being built at a cost of US\$500m and will seat 100,000.

Fast Flow won this contract in the face of tough competition but eventually we were chosen to ensure we keep everyone dry

during the opening and closing ceremonies. The stadium will also be featuring track and field events.

This is all part of the XXIX Olympiad.

The Beijing Main Olympic Stadium is better known to all as the "Bird Nest".

Wonder Why?



Main Olympic Stadium in Beijing

SEE MORE STADIUMS INSIDE PAGE 6

**A full Technical Feature
will be available on our
Future Fast Flow Connection**

CONTENTS

Fast Flow - Setting New Olympic Standards.

by Colin Thoms 01

Hua Hin Market Village - More Than A Shopping Centre.

by Michael Teh 02

IES Evening Talk.

by Janice Tay 02

Harvesting Precious Resources.

by Raja 03

What Is 'Hot' In Singapore.

by Kiew Pei Teang 04

Using PVC In A Siphonic System

by Jason Nelson 05

The Importance Of Correct Gutter Sizing In A Siphonic System.

by Jason Nelson 06

Stadiums Around The World.

by Colin Thoms 06

Maintenance.

by Colin Thoms 07

FAQ by Ong Hwee Bin 08

Just for Laughs by Etta Cheong 08

Kindly note that the information and opinions expressed in "FAST FLOW CONNECTION" and in the advertisements do not indicate endorsement on the part of our magazine nor of the staff and members working on "FAST FLOW CONNECTION". The publisher is not at any time responsible for the quality or effectiveness of advertisers' products and services.

No reproduction is permitted in whole or in part without the written consent of the publisher.

We would love to hear from you. If you have a viewpoint, which you would like to share or a story idea, please drop us a note either by fax, e-mail or snail mail.

email: info@fastflow-uv.com

Hua Hin Market Village – More than a Shopping Centre

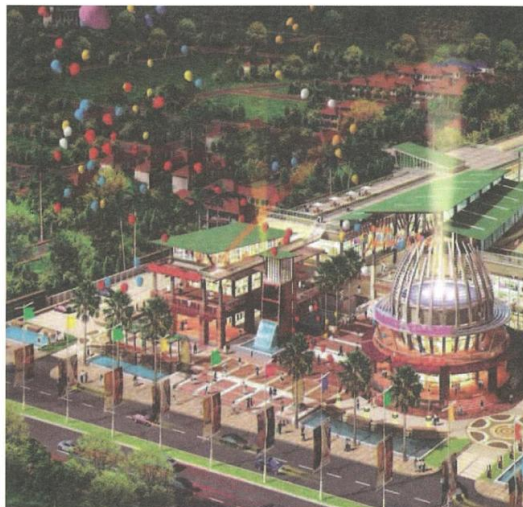
Michael Teh

If there is one thing that every developer needs, it is lowering maintenance cost. This state-of-the-art, three storey shopping complex covers 27 "rai" (means street in Thai) with over 60,000 square metres of shopping area.

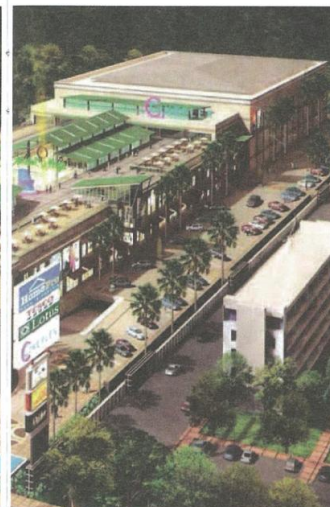
The main concern of the engineering company during design was the numerous down pipes, manholes and underground drainage (with conventional system). Land settlement was also a big consideration for underground RC pipes taking rainwater to the public drain.

Fastflow Siphonic design eliminated most of the down pipes and hid those that were needed. Furthermore, the design reduced civil works which are high maintenance items by taking away hundreds of metres of underground RC pipe and the associated manholes.

Fast Flow – helping achieve better aesthetics whilst lowering client's maintenance cost.



Hua Hin Market Village in Thailand



IES Evening Talk

On the 16th December 2005, Fast Flow conducted an evening talk at the IES building on the subject of Siphonic Roof Drainage.

This talk was conducted at the invitation of the Institute of Engineers. The presentation included a video clip showing flow patterns for the more technically inclined. The meeting was attended by Engineers and Architects who were keen to have an insight into the development of siphonic technology.

Fast Flow speakers outlined how siphonic system works and presented many projects showing how Fast Flow applies the technology.



Interaction after the Seminar



Fast Flow Speakers (from left to right): Kiew Pei Teang, Goh Chun Hee, Ong Hwee Bin, Gilbert Ang

Janice Tay

Harvesting Precious Resources

Raja

Water is a commodity and is truly scarce, so much so that in many countries rain water harvesting has been incorporated as an important aspect when designing new buildings.

Siphonic roof drainage system is flexible and adaptable, and with the usage of relatively smaller diameter pipes and the wide range of pipe material, many of the aesthetic requirements of the modern day building can be solved.

Furthermore Siphonic roof drainage system is also an engineered system and can be designed to cater for long horizontal distance without gradient. As a matter of fact Fast Flow has designed and completed projects with horizontal distance of over 600m without gradient! Bravo Fast Flow Engineering!

With such abilities, rain water from several buildings can be diverted to a single collection point that can be located far away from the building. Just imagine the valuable time and money that can be saved. With Fast Flow Siphonic, the possibilities are endless.

What is 'hot' in Singapore?

Kiew Pui Teong

Many new residential and mixed development projects in Singapore are being built with an E-deck. E-deck is an acronym for Environmental Deck comprising attractions such as Sundeck, Pools, Landscape or Playgrounds, etc. This new concept brings with it new challenges for designers; such as space constraint and co-ordination, water tightness and maintenance. None is more difficult to resolve than the surface water drainage system. The traditional solutions of open concrete drains or closed pipe systems working conventionally are not cost-effective as they increase building height and give conflict between structure and services. And even if these problems are overcome, other issues need to be addressed such as ensuring health hazards are not created with water ponding and the like. The problems are many.



Environmental Deck at Compass View Condominium

So, what is the solution?

Well the Fast Flow's siphonic solutions are relatively simple and already well proven in the Singapore market. Much reduced headrooms are achieved whilst still accommodating other services. Flexibility of rainwater outlet position and multiple linking of systems all contribute to a neater design at an affordable price.

Using PVC in a Siphonic system

Over the past few months, I have been getting a lot of concerned calls asking how we can use PVC (DWV) for Siphonic drainage when everyone else uses HDPE. Are we mad??? PVC can't be used for Siphonic roof drainage!!!! Well, while using PVC for Siphonic roof drainage is a new concept in Australia, it has been used worldwide for many years.

Fast Flow has no allegiances with any material manufacturers, therefore we don't endorse any particular type of material. HDPE is a very suitable and versatile material for many applications, but there is no reason why other products can not be used for Siphonic Drainage. When considering the materials selection for a project, a number of factors need to be taken into consideration.

- Will the pipes be exposed to sunlight/weather/heat/cold?
- Is there an environmental consideration?
- What size pipes are required?
- What experience do the installers have?

Arguably the most important factor to be considered is the maximum negative pressure allowable by the characteristics of the pipe. The collapse pressure of a pipe is calculated by the Poisson's ratio. Poisson's ratio is the ratio of transverse contraction strain to

longitudinal extension strain in the direction of stretching force. Tensile deformation is considered positive and compressive deformation is considered negative. Most Siphonic systems in Australia are currently installed using HDPE (High Density Polyethylene)

As you can see, PVC actually performs better than HDPE in most sizes because it is more rigid and can accept a greater negative pressure before collapsing occurs. As long as the design is based on the individual characteristics of the material being used for the installation and the correct balancing and calculations are

done, any material can be used for Siphonic roof drainage. So, next time you decide to install a Siphonic system on your project, remember you do have a choice. Have a think about what materials YOU WANT to use, NOT what your siphonic company TELLS YOU to use.

Chart 1 below displays the maximum negative pressure of drainage HDPE that is currently used for Siphonic drainage in Australia (PN4 up to 160mm and PN3.2 up to 315mm) which has a Poisson's ratio of 0.4.

Material:	HDPE	E Modulus:	800N/mm ² (at 20 degree temperature for 5 min. duration)
Country:	Australia	Poisson's Ratio:	0.4
Manufacturer:		Design Stress:	64.2 kgf/cm ²
Specific Weight:	0.95 g/cm ³		

DN	OD (mm)	ID (mm)	Wall Thickness	Specification	Pressure* Rating (bar)	Working Pressure** (bar) at 30° C	Collapse Pressure (bar) with 1.4 safety factor
40	40	34	3	PN4	4	11.11	7.31
50	50	44	3	PN4	4	8.59	3.47
56	56	50	3	PN4	4	7.56	2.42
63	63	57	3	PN4	4	6.63	1.87
75	75	69	3	PN4	4	5.47	0.97
90	90	83	3.5	PN4	4	5.31	0.88
110	110	101.4	4.3	PN4	4	5.34	0.90
125	125	115.2	4.9	PN4	4	5.36	0.91
160	160	147.6	6.2	PN4	4	5.29	0.87
200	200	187.6	6.2	PN3.2	3.2	4.16	0.44
250	250	234.4	7.8	PN3.2	3.2	4.19	0.45
315	315	295.4	9.8	PN3.2	3.2	4.18	0.44

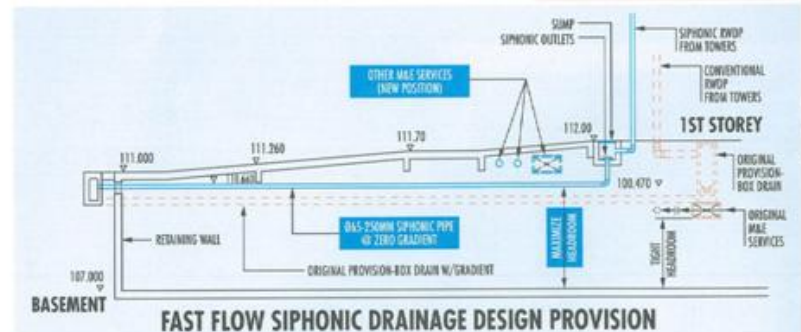
* pressure rated at 20° C • ** calculated pressure rating at water temperature of 30° C • Note: working pressure at 30° C is at 85% of calculated pressure at 20° C

Chart 2 below displays the same characteristics for PVC (Standard DWV ratings shown) with a Poisson's ratio of 0.36.

Material:	DWV	E Modulus:	2800N/mm ² (at 20 degree temperature for 5 min. duration)
Country:	Australia	Poisson's Ratio:	0.36
Manufacturer:	Iplex/Vindex	Design Stress:	100 kgf/cm ²
Specific Weight:	1041 g/cm ³		

DN	OD (mm)	ID (mm)	Wall Thickness	Specification	Pressure* Rating (bar)	Working Pressure** (bar) at 30° C	Collapse Pressure (bar) with 1.4 safety factor
40	42.9	38	2.45	SH	6	10.10	10.01
50	55.8	51	2.40	SH	6	7.49	4.09
65	68.9	63	2.95	SH	6	7.46	4.03
80	82.5	76	3.25	SH	6	6.84	3.11
100	110.2	104	3.10	SMB	6	4.83	1.89
150	160.3	152	4.15	SMB	6	4.43	0.85
225	250.4	228	6.20	SMB	6	4.23	0.74
300	315.5	300	7.75	SMB	6	4.20	0.72
375	400.5	381	9.75	SMB	6	4.16	0.70

* pressure rated at 20° C • ** calculated pressure rating at water temperature of 30° C • Note: working pressure at 30° C is at 85% of calculated pressure at 20° C



Siphonic Drainage for Environmental Deck Design Solution

STADIUMS AROUND THE WORLD



Aomen Stadium – Macau



Shanghai Tennis Centre – China



Vietnam Stadium – Vietnam



Chao Chu Kang Sports Complex – Singapore

The Importance of correct gutter sizing in a Siphonic System

Jason Nelson

The importance of correct sizing of any gutter is sometimes overlooked or deemed “not so important” when considering a Siphonic system for roof drainage on a project. When using a conventional drainage system you would need a very deep gutter to allow enough head over the outlet to allow the downpipe to drain the required amount of water from the roof. (see fig 1) However, most gutters would have sumps installed beneath the gutter to increase the depth around the outlet to allow enough head to

push the water down the pipe. (see fig 2) With Siphonic drainage however, water only needs to rise to the height of the air baffle to prevent the entrance of air into the system. In most cases a depth ranging from 15mm to 50mm around the outlet is sufficient (see fig 3). However, a factor that is gaining more and more importance in Siphonic design worldwide is the understanding of the priming time (or fill time) Priming time relates directly to the time taken for a siphonic system to reach it's full design capacity. During this

transition period, there is a certain amount of water that needs to be collected and held in the gutter. Therefore the determination of the size of the gutter must take into consideration the priming time required by the siphonic system. The fill time of any system can be controlled and engineered to meet the requirement of the gutter. Fast Flow undertakes to calculate the priming time for all systems and projects to ensure the correct operation and safety of the system.

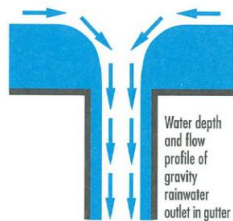


fig 1

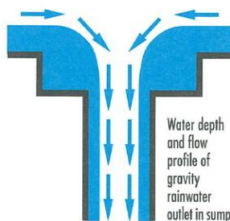


fig 2

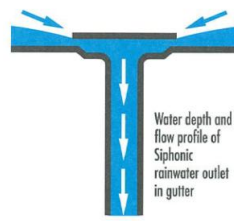


fig 3

NEXT ISSUE

Design and Construction Details to Prevent Water Standing

Colin Thoms

Maintenance

The recent outbreaks of Dengue fever in Singapore are cause for concern to all of us.

Notwithstanding recent government action to control some of the problems through construction industry legislation, there is a lot that the various interested parties in the industry can do to help solve these particular problems. We refer of course to water being retained on roofs and gutters.

about keeping mosquitoes from breeding, it is about looking after your building in order to prevent flooding. It is about ensuring that potential problems are foreseen and dealt with before they become major cost items. Currently, building need maintenance to lifts, air-conditioning, sprinklers etc...looking after roof gutters, façade is no different.

The range of photographs we show here tell their own story. It is clear Building Owners should implement maintenance procedures. Consultants should encourage developers to plan the maintenance procedures just as is done when the ACMV(HVAC) contracts are placed.

So what can be done?

Fast Flow is very much involved in getting rainwater from roof to surface drain. Whilst surface drains may themselves have issues we will not address them here. There is no doubt that problems occur from roofs and gutters.

Holding water when they shouldn't.

The main causes of the problem are either poor design / construction or poor maintenance. In this article, we will only address the latter.

In our next Connection, we will feature the most common issues we meet in design / construction.

What do we mean by maintenance and how does it help? Well maintenance is not only



QUESTIONNAIRE For NEWSLETTER

Ong Hwee Bin

1. How to ensure that the Siphonic Roof Drainage System will function as specified by the Consultants/Clients?

The key selection in the Siphonic Roof Drainage system will have to comply with the following key criteria:

- e) The Siphonic System had been tested and certified by independent test bodies (e.g. BBA, DIN etc) to ensure that the system has been properly tested for technical performance.
- f) The Specialist /System should have relevant experience in designing and installing system of similar height/area catchment etc.
- g) The Specialist should have sufficient technical support in terms of design and installation requirement to be able to handle day-to-day queries/changes/modification etc. for projects on site.
- h) All engineering calculation of the Siphonic System should be endorsed by a local Professional Engineer to ensure that all calculations had been checked to ensure proper performance of the System.

Please feel free to contact us without any obligation concerning any issue or constraint you may encounter with your project, so that we can offer our "Value-Added Engineering Solution", for your information and consideration.

You may also contact us for a free seminar on the following topics:

- Introduction of Siphonic Roof Drainage System
- Application of Siphonic Roof Drainage System in different types of Building/Areas

Feel free to explore our website
www.fastflow-uv.com

Fast Flow Siphonic Pte Ltd

1 Fifth Ave #04-04
Guthrie House
Singapore 268802
Tel: 65-62599601 Fax: 65-62597105

Fast Flow Siphonic Sdn Bhd

No 4 Jalan TPK 2/6
Taman Perindustrian
Kinrara Puchong 47100
Selangor Darul Ehsan
Kuala Lumpur Malaysia
Tel: 603-80755609 Fax: 603-80756509

Fast Flow (Thailand) Co., Ltd

Nutri Building 3rd Floor
46 Soi Pattanakarn 20, Suan Luang
Bangkok, Thailand 10250
Tel: 662-3693240 Fax: 662-3693245

Fast Flow Co., Ltd

A-1-A Lane 868 HuaShan Road
Shanghai 200050 China
Tel: 8621-62122018 Fax: 8621-62122019

Fast Flow Systems Co., Ltd

Rm1506 South Tower
New World Times
Centre 2191
Guang Yuan Dong Road
Guangzhou 510500 China
Tel: 8620-87745059 Fax: 8620-87745090

Fast Flow (Australia) Pty Ltd

Suite 30 Level 2 Silverton Place
101 Wickham Terrace Spring Hill
Queensland Australia 4000
Tel: 617-38393295 Fax: 617-38313257

Just for Laughs

Etta Cheong

Use Fast Flow

"I told him he should have used Fast Flow."

