fast flow CONNECTION

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WHERE IDEAS FLOW

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VOLUME 2

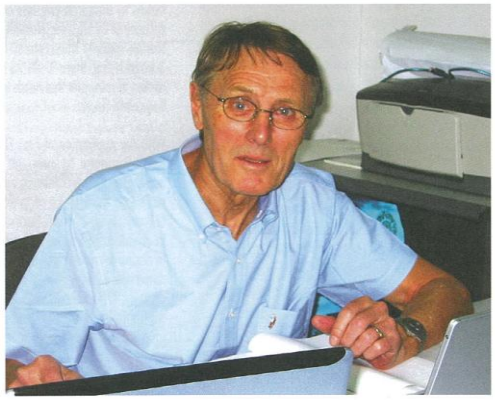
37 Years In The Making!

Colin Thoms

"Doesn't time fly when you are enjoying yourself", says Per Sommerhein, co-developer of the UV-System. UV started in Finland in 1968 under Olavi Ebeling and Per joined him in the development of the system around 1972. In the early days, the system was restricted to simple stacks and of course in Finland, the pipe material used was copper. During the 70's, the system spread to other parts of Europe and Geberit took up the UV-System distributorship for Central Europe. "As we all know, the UV-System developments have lead to various systems worldwide but no one has ever surpassed the technical aspect of the UV-System", chuckled Per.

Per loves coming to Asia. "When the UV-System was used in Singapore in 1994, who would have guessed that this would lead to such a success!" Per recalls, "Fast Flow is now synonymous with UV-System and is well known throughout South East Asia, China and Australia.

Per has over 30 years of research and development under his belt. Let's hope he is up for a few more years yet.



Mr Per Sommerhein at work during his last visit in Singapore.

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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

Getting The Materials Right

Jason Nelson

NTU-Techno Plaza, Singapore - in uPVC and stainless steel pipe

Baiyun Airport, China - in stainless steel pipe

More and more Developers, Architects and Engineers are choosing Siphonic as their preferred method of roof drainage. With this in mind, the range of diverse projects must be taken into account and more importantly, the choice of material must be taken into account.

High Rise buildings for example are a big favourite these days. With the reduction of down pipes and outlets, the cost saving of using Siphonic on a high rise are very appealing.

Although there is currently no Australian Standard for Siphonic Roof Drainage Systems, common sense must come into play. Following the trends as seen in other countries, the World Standard organisation are rightfully requesting that all **Roof drainage systems must be able to withstand the hydrostatic positive pressure should there be a blockage.** The majority of projects in Australia are using HDPE as the pipe material. HDPE would not always be suitable in this case. As buildings above 40 metres in height, the pipes need to be pressure rated about PN4 positive pressure. A more careful approach must be undertaken. Cast Iron or Stainless Steel would be more obvious choice in this situation.

Controlling Floods in Bangkok City – Siphonic roof drainage systems

Goh Chun Hee

Flood in Bangkok City.

Floods have been a major problem in Bangkok City for many years due to its low-lying level. The Bangkok Metropolitan Administration (BMA) reports that the surface drains in Bangkok city has an estimated capacity of 775m /sec. Notwithstanding this storage capacity when rainfall continues for 3 hours a day, there is still 13 million cubic meters of rainwater that needs to be handled to prevent floods.

With the application of Fast Flow Siphonic Roof Drainage System, an accurately engineered system of rainwater management can utilize the large open-to-sky roof areas in Bangkok City to retain much of this shortfall in capacity. The time taken for the rainwater to discharge can be accurately calculated and timed with consideration of surface drainage capacity. This may ultimately improve flood control in Bangkok City without significant investment from any parties involved.

Fast Flow Siphonic Roof Drainage System can create a win-win situation for building owners as well as the general public.

Fast Flow Enters Australia

Jason Nelson

Jason Nelson in Fast Flow Australia.

October 2004 saw the opening of the newest member of the Fast Flow group, Fast Flow Australia. Managed by Jason Nelson, the Brisbane based office is responsible for Australia and New Zealand. Jason has over 10 years experience in the plumbing and construction industry and over 5 years experience in Siphonic Roof Drainage Systems. With Australia proving to be an already competitive market in terms of Siphonic Roof Drainage systems, many Architects and Engineers have welcomed us into the market due to the many advantages the Fast Flow-UV system has over its competitors.

Opening Of New Office In Bangkok

Michael Teh

Thailand New Office in Pattanakarn.

Our integrated software demo in Bangkok office.

Michael Teh and his team have done such a great job over the last three years that Fast Flow Thailand have had to move to much larger office in Pattanakarn.

Over sixty projects have now used the Fast Flow UV system and these include Central Ratanitibet, Big C Aomjai, Toyota Showrooms, Ford Showrooms and many large industrial projects like Siam Food and Thai Summit.

Michael and his team would like to take this opportunity to express sincere thanks to all those who have helped make Fast Flow Thailand a success. "Whilst the business is global," Michael says. "We think local."

Michael is adamant he can play his part in Thailand by maintaining "our position as the leading siphonic rainwater specialist through product and service development".

For contact please see back cover.

Just for Laughs

Etta Cheong

A Conversation between two Bangladeshi

Suckalah : "Rain for so manee, manee days. Everywhere flood! Why the water in the gutter does not flood? Deh." SIGH! "Cannot wash my gloves here, deh!"

Ibrahium : "I know …I know… Aktar say this thing is vely, vely powerful, deh! Last time, my hand also got in , deh!"

A BLUSH WAS SEEN ON IBRAHIM'S FACE.

Suckalah : "Ha..ah! Ha! Your hand can get sucked in? Woah..ah, ha..ha!"

WHILE LAUGHING AT IBRAHIM.

Suckalah

Thought : "Next time, better not wash my gloves here, leh! It might be my turn to get sucked into the pipe, deh!

Construction Technologies Driven By Innovative Design - UTP Malaysia

Ng Joo Lim

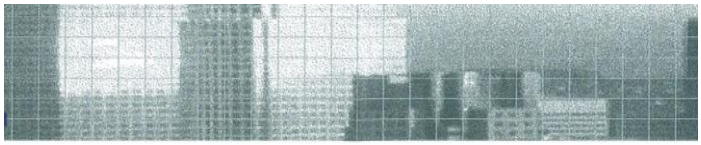
In 2001, Fast Flow challenged its principal Sommerhein AB with the task of developing an outlet to solve a major construction problem in Malaysia. This outlet was to become the UV122 capable of draining 125l/sec.

It has since been used in several special projects further enhancing solution capabilities to clients. Every now and again, a project will come along which really challenges specialists such as Fast Flow. University Teknologies Petronas (UTP) was such a project. The architectural design required that the rain water system be concealed and this meant that the downpipes could only be brought down through the 800dia. structural steel columns. The columns were designed to span 60m and with the roof width being 30m the drained area was approximately 1800m . With the design rainfall intensity at 250mm/hr, a conventional system would require a vertical downpipe of 350mm. Placing this pipe inside a reinforced concrete filled steel pipe is one issue but connecting into a pipe this size at the top and the bottom presented structural designers and contractors with a major headache.

Alas, Fast Flow could reduce this vertical pipe to 125mm diameter. Our input didn't stop there. Fast Flow worked out how to install the pipe in conjunction with the steel fabricator to allow the work to be done off site.

Careful detailing of the on site hook ups was planned allowing ease of erection and subsequent placement of concrete around the pipe without pipe collapse from hydrostatic pressure.

A further benefit of the change to siphonic was the elimination of all horizontal pipework, which would have required the employment of several undersize humans to crawl inside the structural truss-work. Altogether, another fine solution from Fast Flow-UV.



Fast Flow "takes off" in China

Colin Thoms

Fast Flow has been in China now for over 5 years.

In 2000, the first full contract that was undertaken was Ningbo Airport. Since then Fast Flow has gone onto complete six more airports including the "Pearl of the South" the new Baiyun Airport in Guangzhou. There are still quite a few more airports to go but none will reach the 'dizzy heights' of Lhasa in Tibet. This highest airport in the world needed speed design consideration in the hydralic calculations to allow for unique vapour pressure of water at high altitude.

In 1999, Fast Flow entered into a joint venture with a local partner for Scienceland, Shanghai.

This was a landmark building for a landmark occasion.

Beyond airports, Fast Flow is securing a full range of building types throughout China with main regional offices in Guangzhou, Shanghai and Beijing. Fast Flow also has several satellites branch offices, so we are never far from the action.

Ningbo Airport

LiuTing Airport

Jin Gang Shan Airport

Lhasa Airport

ChongQing Airport

HuangShan Airport

Baiyun Airport

Easier Construction In Malaysian Hospitals

Colin Thoms

Pandan Hospital, Johor Bahru

Serdang Hospital, Putrajaya

Alor Setar Hospital, Kedah

Hospitals are not the easiest of building projects to design or indeed construct. Why?

The design of sensitive areas such as operating theatres and laboratories as well as hospital wards demands particular attention to clean environment and noise attenuation issues. By the time it gets to construction, a huge coordination exercise is needed to deal with the multitude of services demanded in such facilities.

Use of the Fast Flow -UV siphonic system does nothing but make this job much easier. With zero gradient pipeworks and much smaller pipe size, it leaves plenty of room for the other services to be installed.

As the siphonic system is generally self-cleansing, the client is generally assured that they will not face issues with water that lead to bacteria and disease. Only recently, one of the hospitals in Johor faced issues due to bad service installation but that was not attributed to the siphonic system. Testing during installation especially in hidden areas should eliminate such problems.

The smaller size of pipe and nature of the flow should also allow noise attenuation to be done to a better and acceptable standard.

With three major hospitals already completed, Fast Flow is now working on Kuching Medical Centre continuing our involvement in this niche sector.

Overdesigning in siphonic systems

Goh Chun Hee

The level of safety and protection that a rainwater drainage system offers is normally reflected in the return period upon which the system is designed. A system that is designed to a 20 year return period rainfall with a certain duration generally provides better protection for the building than a system designed to a 5 year return period rainfall.

It is therefore commonly understood as higher rainfall intensity gives a bigger safety buffer. Therefore designing with higher rainfall intensity is always safer and always better.

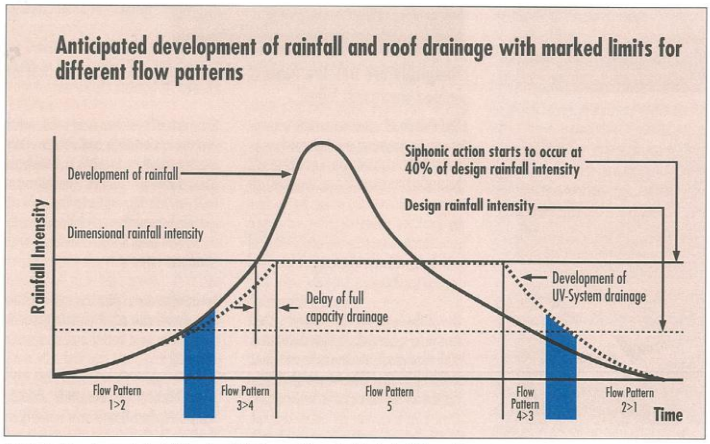
While this statement may be correct in most circumstances, over designing with very high rainfall may actually be bad for siphonic roof drainage.

The fundamental of siphonic system engineering is the Bernoulli energy equation, which is correct when the system is calculated in full-bore condition; i.e. totally filled with water without air. Siphonic systems are calculated to achieve full-bore flow at design flow rate; i.e. at certain design rainfall. A question that is commonly asked is "what happens if it doesn't rain that much?"

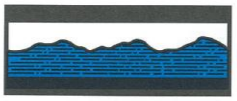
The answer is; siphonic actions starts occurring in siphonic systems at rainfall intensity lower than the design rainfall. i.e. Siphonic systems do not need to fully achieve full bore flow in order to function. Researches have shown that siphonic action start occurring in a siphonic system at rainfall intensity as low as 40% of the design rainfall. At between 40% to 60% rainfall, the system fluctuates between gravity flow and siphonic flow.

When the rain gets heavier, at above 60% of design rainfall, siphonic action stabilize inside the pipe. The system achieves its full capacity when the rain reach the design rainfall intensity.

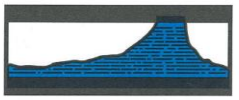
During the transition between gravity and siphonic flow, that occurs at around 40% of the design flow rate; the flow pattern transforms from pulsating flow



Anticipated development of rainfall and roof drainage with marked limits for different flow patterns.



Pattern 1 : Wavy flow



Pattern 2 : Pulsating flow

Pattern 3 : Plug flow

Pattern 4 : Bubble flow

Pattern 1 : Full bore flow

Flow direction

to plug flow. Water plugs starts to form inside the pipe which causes a sudden increase in flow velocity. During pulsating flow, a certain 'pumping' action can be observed inside the siphonic system.

The increase in flow velocity and the 'pumping' action push and wash anything that may be inside the pipeworks (eg. Debris, leaves) away, and therefore achieving the self-cleansing effect of siphonic systems.

It is important to ensure that all pipeworks are designed with this consideration in mind. Frequent occurence of self-cleansing effect is important in preventing the pipeworks from long-term chokage due to sedimentation.

Taking example of a siphonic system designed to 250mm/hr in Singapore. The design rainfall of 250mm/hr has a return period of 12 years with a continuous duration of 5 minutes.

40% of 250mm/hr is 100mm/hr; which is equates to a rainfall with a return period of 1 year with a continuous duration of 5 minutes. This means that a system that is designed at 250mm/hr has the probability of achieving siphonic action, and self-cleansing effect for a continuous duration of 5 minutes at least once every year. (The same system may achieve siphonic action and self cleansing effect of shorter durations more than once in a year.)

If the system is designed to double its rainfall intensity, say 500mm/hr, 40% of the design rainfall equates to 200mm/hr; which has the return period of close to 3 year for duration of 5 minutes. In this scenario, the probability of achieving siphonic action during normal storm is reduced to once in 3 years.

The increase in rainfall intensity in this case has negative effect on achieving frequent self- cleansing of the system.

Designing systems at higher rainfall intensity, which translate to larger flow rate, also results in larger pipe sizes. This inevitably results in longer time for the system to achieve siphonic action. During the initial stages of rainfall, the horizontal collector pipe in a siphonic system is filled up. The filling up of collector pipe is a criterion for the eventual formation of siphonic action in the system. This is generally known as priming time of a siphonic system. The larger the collector pipe, the longer the priming time. The effect of this is deeper water depth in gutters; and the lesser probability of achieving siphonic action as discussed above.

Very large collector pipes connected to large vertical stacks may run the risk of never achieving siphonic action if not designed correctly. The minimum amount of water flowing down the vertical stack required to initiate and maintain siphonic action increases significantly when pipe diameter increases.

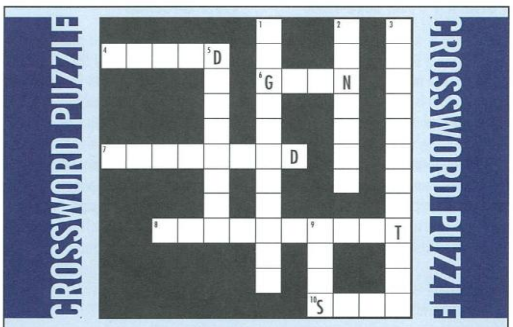
Correct selection of design rainfall intensity is therefore important to good engineering of a siphonic system. Designing at higher rainfall generally gives some safety buffer to a building. Over designing too much without checking its impact on system priming and self-cleansing may offset the balance between safety and good engineering.

QUESTIONAIRE For NEWSLETTER

1. Is the siphonic system maintenance free?
The roof where the siphonic outlets are located need periodic maintenance similar to any conventional system. For the siphonic pipeworks, they are self-cleansing as the velocity of the water within the pipeworks is discharging at 2 to 3 times higher than the conventional system. It flushes out whichever debris that is small enough to get into the pipeline.

2. Does the siphonic system require a sump at the discharge on the 1st storey?
The system will have the same discharge requirement as per the gravity rainwater downpipe system. The system will discharge the rainwater to any kind of discharge point, e.g drain, sump. A sump construction is not a requirement for the siphonic system. It depends on the surface drainage design by the civil engineer.

3. Will the siphonic system work during light drizzle?
During light drizzle, the siphonic system behaves like a conventional system i.e there is air and water mixture within the pipework. However as the intensity of the rain increases, siphonic action will be activated within the pipeworks.



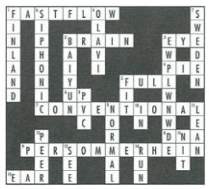
Across
4 Too much water (5)
6 Financial improvement (4)
7 Siphonic system pipe is self-_____ with its high velocity flow (8)
8 Fast Flow is the top _____ in the siphonic rainwater system (10)
10 Goes from end to end without a 's' (4)

Down
1 Application of design with calculation (11)
2 Capital of Thailand (7)
3 An industry that requires good knowledge of building structure and designs (12)
5 Fast Flow pipes do this (8)
9 Lower in numeration or quantity (4)

Answer for Volume 1

ACROSS 1.FASTFLOW, 2.BRAIN, 3.EYE, 4.PIE, 5.FULL, 6.UP, 7.CONVENTIONAL, 8.DNA, 9.PERSOMMERHEIN, 10.EAR,

DOWN 1.FINLAND, 2.BAIYUN, 3.ESPLANADE, 4.OLAVI, 5.FIT, 6.SIPHONIC, 7.SWEDEN, 8.PVC, 9.NORMAL, 10.IN, 11.LEAN, 12.PEER, 13.SEE, 14.RUN,



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

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