Airport Development in Indonesia

Soekarno Hatta Airport Terminal 3 Ultimate – Artist's Impression

Since 2010 Fast Flow has completed nine airport projects and drained more than 330.000 square metres of airports' roof area in Indonesia. The projects include Sultan Hasanuddin Airport (Makassar, Sulawesi), Kualanamu International Airport (Medan, Sumatra), Ngurah Rai International Airport (Denpasar, Bali) and Komodo Labuan Bajo Airport (Labuan Bajo, Flores). In December 2013, with the help of Fast Flow's licensed distributor in Indonesia (Siphonic Flow Mandiri), Fast Flow was appointed to provide rainwater drainage solution for Soekarno Hatta International Airport Terminal 3 Ultimate.

Soekarno Hatta International Airport is currently the largest airport in Indonesia serving the greater Jakarta area on the island of Java. The Terminal 3 development in Jakarta will provide an exceptional aviation and passenger journey experience and meet the needs of Indonesia's growing aviation and tourism industry.

Siphonic Flow Mandiri's design team works closely with Fast Flow's system consultants in Singapore to analyze the water flow and design the solution to control the water depth on the roof top as well as transporting the rainwater to the rainwater tank. The project utilizes 181 PRIMO™ outlets to drain a total roof area of 169.350 square metres.

Fast Flow's pipe (psPipe™) is also used extensively in the discharge pipeworks and stacks. The psPipe™ is specially designed to withstand PN6 (positive pressure) and -0.9 bar (negative pressure) that occur in pressurised and siphonic flow. Manufactured from LEAD-FREE UPVC material, it makes Fast Flow psPipe™ ideal for rainwater recycling as it provides a safer way to do this by minimising the water pollution.

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Beijing Inter IKEA Centre

Beijing Inter IKEA Centre, phase II – Artist's Impression (http://www.iicg.cn/en-gb)

Fast Flow started work on the Beijing Inter IKEA Centre, phase II in July 2013. The project is currently considered the largest IKEA store in the world. It has a large roof area of 70,000 square metres that comes with a very complex structure which required a challenging hydraulic calculation in the design stage.

Beijing Inter IKEA Centre project utilizes a lot of downpipes and outlets due to the complex roof and building structure, which resulted in complicated catchment areas. The water catchment is complex (tree like configuration) as it draws water from many roofs at varying levels and sizes. This project also requires high level of precision in design planning, due to the space limitations which confined the pipe sizes to smaller diameters. The intensity of work on hydraulic calculation is very high.

The solution was to create a system that is fit for the requirements in the design and hydraulic calculation. When designing the system, Fast Flow's priorities were to get a stable pressure and flow rate, to choose energy efficiency and to find a solution that would work in a constrained space. Fast Flow's siphonic roof drainage technology lived up to all criteria; it brings out the beauty of a building's design rather than work against it. Fast Flow's siphonic system combines intelligence design and precise engineering, so clients can reach new frontiers in architecture.

Sound Level

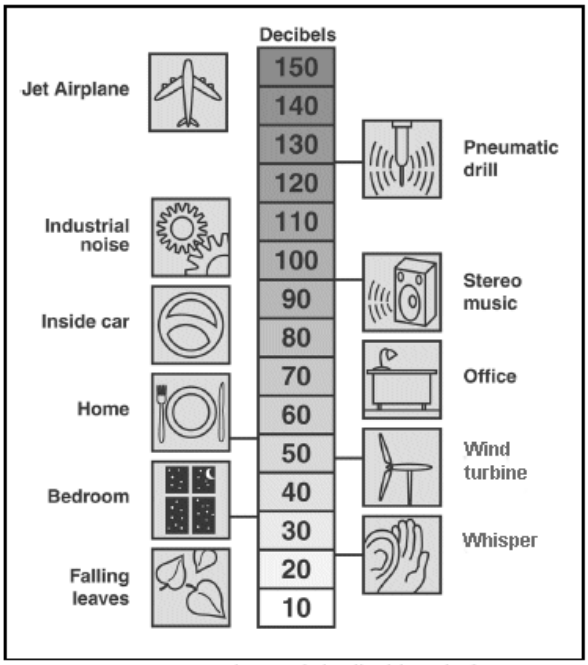
Sound level is a complex question as there are many variables affecting it (e.g., flow rate, configuration, velocity of flow at different stages and the material used). In summary, siphonic system when operating under full bore flow does not generate sound.

Sound occurs when there is an air and water mixture inside the pipes (this is very similar to the situation in gravity rainwater systems). We have conducted tests* and measured the maximum sound level from an exposed pipe during this transition period to 56.7 dB(A). This is very much similar to typical sound level in a quiet office or at home.

Note that this sound level is measured immediately next to an exposed UPVC pipe. It is very rare for the pipeworks to be left exposed in a noise sensitive location. Ceiling, box up can be used to further reduce the sound to a desired level. For example, a pipe with 56.7 dB(A) behind 1/2" Gypsum wall board of STC 28 could reduce the sound level to 28.7 dB(A).

The desired sound level and the suitable insulation or box up material will have to be advised by an acoustic specialist.

** For more information regarding the technical report on the sound level please send an email to communications@fastflowgroup.com*



BOUNDARY NOISE LIMITS FOR FACTORY PREMISES

The maximum permitted boundary noise levels are as follows:

Types of affected premises	Maximum permitted noise levels (reckoned as the equivalent noise level over the specified period) in decibels (dBA)		
	Day (7am-7pm)	Evening (7pm-11pm)	Night (11pm-7am)
Noise Sensitive Premises	60	55	50
Residential Premises	65	60	55
Commercial Premises	70	65	60

Types of affected premises	Maximum permitted noise levels (reckoned as the equivalent noise level over 5 minutes) in decibels (dBA)		
	Day (7am-7pm)	Evening (7pm-11pm)	Night (11pm-7am)
Noise Sensitive Premises	65	60	55
Residential Premises	70	65	60
Commercial Premises	75	70	65
Factory Premises	75	70	65

Stagnant Water Inside Siphonic Pipe

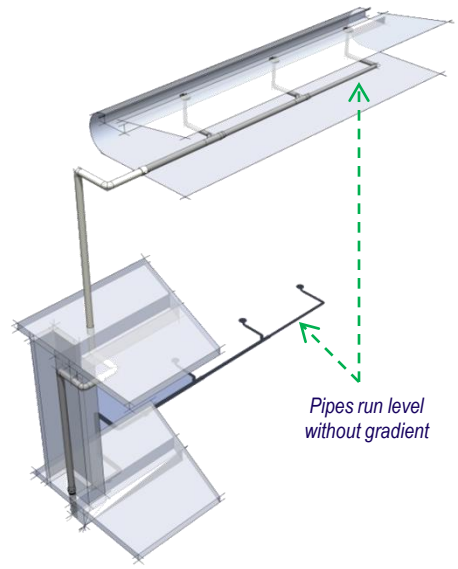
Question:

Siphonic rainwater downpipes (rwdp) don't have a gradient. What happens to the stagnant water inside the pipe? Does it lead to mosquito breeding problem?

Answer:

There's air movement inside the pipe, especially during the day, where the roof top tends to be hotter than lower portion of the pipe. Air moves upwards due to this stack effect, this causes evaporation. We have done some evaporation calculations* in a 100, 150 and 200 diameter pipe. With 3mm of stagnant water, the stagnant water will evaporate in approximately 36 hours.

On question of mosquito breeding, the cycle of breeding needs 7 days. As water in pipes will dry up within 3 days, there is no risk of mosquito breeding.



** For more information regarding the technical report on rate of evaporation of rainwater in level pipe please send an email to communications@fastflowgroup.com*

Supply Chain Management

Fast Flow launched its first Supply Chain Management Project on Wednesday, 29th October 2014. This half day event took place at The British Club, Singapore.

Attended by Fast Flow's Executive Committee Members, Group Marketing Executive, Group Supply Chain Coordinator and Group Logistic Controller, the aim of this meeting is to launch the project on supply chain with Mr Joe Lombardo guiding Fast Flow through brainstorming to confirm the core capabilities in supply chain execution model and KPI setting for integrated supply chain.

Mr Joe Lombardo is an accomplished supply chain professional with 35-year expertise from his sterling careers in supply chain management and financial control at STMicroelectronics and Volvo.

Mr Colin Thoms, Chief Executive Officer, Fast Flow Group

Mr Joe Lombardo, Business Consultant, ESP Consult

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