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## **Hydromax™ Siphonic Roof Drainage system Frequently Asked Questions.**

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1. **How does a Hydromax™ Siphonic Roof Drainage system work?**

A. A Hydromax™ Siphonic Roof Drainage system utilises the full height of the building to provide the energy to create a powerful siphonic action. A collection of elements combine to create the Hydromax™ Siphonic Roof Drainage System. The piping system is empty prior to a storm event occurrence. As the rainfall event starts, our unique Hydromax™ Siphonic Roof Drain prevents further air-entry into the pipework system whilst its Anti-Vortex fins also stop Vortex formation. Our technically advanced HydroTechnic™ analytical design software program has unsurpassed accuracy to determine the pipework diameters necessary to rapidly fill and prime the pipework system to provide optimised performance. Hydromax™ will utilise significantly smaller pipe diameters than that required in a traditional gravity system. As the small diameter pipes prime and the water reaches the vertical downpipe, the water accelerates due to the forces of gravity. This acceleration creates the negative pressures that give the system its 'Siphonic' title and the forces literally suck the water off the roof until the rainfall event abates.

2. **How do the costs for a Hydromax Siphonic Roof Drainage system compare to a Traditional Gravity solution?**

A. A Hydromax™ Siphonic Roof Drainage System is in fact normally less expensive. Savings of 25 to 45% are often attained due to the significant reduction in underground drainage requirements together with the associated pipe installation and trench work (excavation, soil treatment, bedding, pipe laying, test, backfill, compaction, further backfill, and re-test costs.)

3. **What types of buildings are suitable for a Hydromax™ Siphonic Roof Drainage system?**

A. This generally depends on the location and design rainfall rate. A building with a roof area of collecting 80 litres per second (1400 GPM) or greater will normally achieve commercial benefits. However, smaller roof areas have been drained using a Hydromax™ Siphonic Roof Drainage system to achieve the technical benefits.

4. **What technical /practical benefits does a Hydromax™ Siphonic Roof Drainage system offer?**

A. Horizontal small diameter pipework is installed without any gradient/slope;  
Smaller diameter pipes running full-bore that provide self-cleansing properties;  
A significant reduction in underground drainage is achieved;  
Rainwater management is provided through the ability to route rainwater pipes to water storage/attenuation/recycling receptacles;  
Routing of rainwater pipes to desired locations which frees up valuable building space;  
Routing of rainwater downpipes to the perimeter of buildings eliminates the need for below ground drainage within the building footprint;  
Easy co-ordination of services due to pipework running flat level;  
Reduced construction programme time due to fewer pipes;  
Fast and safe evacuation of rainwater from the building roof;

5. **Why use a Hydromax™ Siphonic Roof Drainage System?**

A. Hydromax™ is an innovative high-performance roof drainage system which utilises the power of a siphon to route small diameter rainwater pipes horizontally without gradient to the perimeter of buildings thus eliminating drainage under the building floor whilst offering significant cost savings with efficient rainwater removal.

6. **What is wrong with Traditional Gravity Drainage Systems?**

- A. The performance of Traditional gravity drainage systems is restricted by a number of factors. These include:  
The driving force is the depth or 'head' of water above the roof drain,  
The gradient available to allow the water to flow for horizontal pipe (this gradient also restricts the distance a pipe can travel), leading to multiple downpipes and large amount of below ground drainage.  
Gravity drains largely require  $\frac{2}{3}$  air to transport  $\frac{1}{3}$  water.  
Vortex formation on vertical gravity pipes results in the water being transported in a spiral motion rather than straight through the pipe.  
The above factors result in an extremely inefficient drainage solution.
7. [How is the roof designed to suit siphonic drainage?](#)  
A. Your roof should be designed as to how you want it. The Hydromax™ Siphonic Roof Drainage system is designed to suit the roof not vice-versa. However, the high performance HydroMax™ Siphonic Roof Drains can result in fewer drains with less roof penetrations and so early design co-ordination achieves the optimum solution.
8. [Does the roof structure have to be different to cope with a Hydromax™ system?](#)  
A. No, but there is a possibility that with a Hydromax system, rainwater loadings on the structure could be less due to the minimal operating head of water required by our roof drains.
9. [How much standing water on the roof is required?](#)  
A. There will be no standing water on the roof other than ponding caused by structural tolerances. At the end of a rainfall event, the rainwater will drain from the roof and the pipework will empty. All HydroMax™ Siphonic Roof Drain have been tested to ASME 112.6.9:2005 and BS 8490:2007 and ponding curves are available showing ponding depths during peak operation. HydroMax™ is proud to have market leading performance. Frequently ignored is the fact that gravity drains will have significant ponding when in operation, frequently higher than HydroMax™ Siphonic Roof Drains.
10. [How secure are the Hydromax™ Roof Drain components?](#)  
A. Most siphonic roof drains have a number of separate components that perform the functions of eliminating air, preventing vortex formation and to induce the priming process. Through the roof drain design incorporating a one-piece inducer that is securely fixed using dome headed "Allen" bolts, Hydromax has reduced the risk of one or more of these elements being removed or misplaced during maintenance. In addition to being securely fixed, it will be instantly recognised if the inducer is missing.
11. [How does a Hydromax™ Siphonic system terminate?](#)  
A. The Hydromax™ Siphonic Roof Drainage system terminates either by connecting to a suitably vented (to reduce the risk of surcharging) gravity drain or manhole chamber/connecting pit which should be sized to cater for the discharge from the Hydromax™ Siphonic Drainage System.
12. [Can the Hydromax™ Siphonic system run horizontally below ground?](#)  
A. Yes, if the run is calculated into the system design. Where a siphonic system runs horizontally below ground level, the horizontal section will produce energy losses which will counteract the energy gained in the system. As such there will be a point where the system cannot continue in siphonic mode. This point can be determined using our HydroTechnic™ analytical design software program and will be dependent on a number of factors such as height of building, volume of water being drained, frictional losses through pipes, bends, fittings, etc.
13. [What makes the siphon occur?](#)  
A. It is simple Hydraulics that makes the Hydromax™ Siphonic Roof Drainage system function. The height of the building provides the energy and as the small diameter pipes prime and the full bore plug of water reaches the vertical downpipe, the water accelerates due to the forces of gravity. This acceleration creates negative pressure behind the plug which gives the system its

Siphonic title and the forces generated literally suck the water off the roof until the rainfall event abates.

14. [Are mechanical devices or pumps used to prime the pipework to make the siphon work?](#)

A. No, it is simply Hydraulics that makes the Hydromax™ Siphonic Roof Drainage system function. As the small diameter pipes prime and the full bore plug of water reaches the vertical downpipe, the water accelerates due to the forces of gravity. This acceleration creates negative pressure behind the plug which gives the system its Siphonic title and the forces generated literally suck the water off the roof until the rainfall event abates.

15. [Is the pipework always full of water?](#)

A. No, at the end of a rainfall event, the rainwater will drain from the roof and the pipework will empty.

16. [Can a Hydromax™ Siphonic Roof Drainage system cope with flash storms?](#)

A. A Hydromax™ system will cater for flash storms and drain any storm profile up to the rainfall intensity for which it has been designed to, as the HydroTechnic™ analytical design program has a built-in calculation to ensure a system prime time within the "flash-storm" profile.

17. [Can pipework run uphill?](#)

A. No. Theoretically the negative pressures generated would be able to transport the water uphill but in practice this would present a system which would not self-drain and an amount of water would remain trapped at the downhill side of the system. It is therefore not permitted to run pipework uphill.

18. [Is there a maximum number of roof drains that can connect into a single system?](#)

A. The number of roof drains that can be connected into a single system is limited but this number cannot be pre-determined as the limitations are resulting from hydraulics which will be unique for each system within each building. Some of the limiting factors include volume of water, system fill time (time taken to prime), height of the building, horizontal pipe lengths, etc., The Hydromax™ design engineer will advise the optimum solution for your project.

19. [How far can a siphonic system transport water horizontally?](#)

A. Each case is unique and therefore the distance that a Hydromax™ system can run horizontally is dependent on a number of factors. The main factors include 1) the height of the building (the energy for the system), 2) the complexity of the pipework configuration (frictional losses through fittings) and 3) the design rainfall intensity (giving the volume of rainwater to be transported).

20. [How much height does a Hydromax™ Siphonic Roof Drainage system need to operate?](#)

A. Each case is unique and therefore the height necessary to generate the Hydromax™ siphonic action can vary depending on a number of factors. The main factors include 1) the horizontal run length (the frictional energy losses through the pipework system), 2) the complexity of the pipework configuration (frictional energy losses through fittings) and 3) the design rainfall intensity (giving the volume of rainwater to be transported). We have seen small individual systems, frequently used as overflows dropping less than 0.8m (2.6ft)

21. [How does the system work where roof drains linked into a collector pipe have different catchment areas e.g. Does a drain with a smaller area empty quicker therefore allowing air-entry which breaks the siphon?](#)

A. No, one of the key functions of the advanced HydroTechnic™ analytical design software is to "balance" the piping system whereby the designer alters pipe diameters to either restrict water flow or permit additional water flow through the different piping sections. This ensures equilibrium in terms of draining. If a system cannot achieve the necessary balance then an alternative piping solution would have to be utilised normally by taking the roof drain with the least inflow (or alternatively the roof drain taking the greatest inflow) out of the collector system and running separately to drain.

22. **What maintenance is required on a Hydromax™ Siphonic Roof Drainage system?**  
A. All roof drainage systems, Traditional gravity and Hydromax™ should be subject to maintenance to suit local conditions and therefore we recommend the operation of a regular maintenance regime. Local codes or standards should be followed. In locations surrounded by trees or within marine or industrial areas, intervals between maintenance should be reduced as there is a higher possibility of debris gathering. Roof cleanliness is the most important issue. Clearing away of all debris from around roof drains and from within gutters is required however care should be taken not to clean the debris into the roof drains.
23. **Does the Hydromax™ system block more readily than a traditional gravity system?**  
A. No, the system is designed with minimum flow velocities set by codes or standards. The high velocities with full-bore flow ensure the pipe self-cleans. BS 8490:2007 (UK) calls for 1.0 metres per second (3.28 ft/s); ASPE 45:2007 (USA) calls for 3ft per second (0.91m/s) and SS 525:2006 (Singapore) calls for 0.7m/s (2.29ft/s).
24. **Can a Hydromax™ Siphonic Roof Drainage system drain a high rise building?**  
A. Yes. However, sometimes if the building is too high and the hydraulics generate negative pressures that exceed our design parameters, the design engineers will “break” the siphonic action by changing to a gravity flow design at an appropriate point dropping down through the building. With this design the technical and commercial benefits are attained as the pipework can be collected at high level without pitch gradients and fewer rainwater drop pipes are required. Your HydroMax™ design engineers will always ensure you have the optimum design.
25. **Can small balconies be connected into a Hydromax™ Siphonic Roof Drainage system?**  
A. The viability of each case is determined on its own individual merits by the design engineer. If the area is calculated to be large enough to offer sufficient flow for a Hydromax™ roof drain and the design engineer can obtain a solution to the hydraulic calculation then it may be possible. However, the design engineer must be satisfied that the balcony or small roof will not be adversely affected by wind driven rain situations where the rain could be blown to “miss” falling onto the balcony which would subsequently permit air entry into the main system and disrupt the siphonic action.  
Please consult with the Hydromax™ design engineer to discuss the optimum solution for your project.
26. **The system will be designed for a long storm return period (e.g. 100 year storm), can the system block because the full-bore flow conditions are not achieved?**  
A. No. Self-cleansing is achieved when the Plug-flow pattern is achieved with plugs of water filling the full-bore of the pipes pulsing through the pipe work at a high velocity. University testing at Herriot-Watt University by Dr. Scott Arthur has showed this can be achieved at approximately 10% to 15% of the designed rainfall intensity which will occur on a significantly more frequent basis than the full design rainfall intensity.
27. **Can leaves, etc. cause blockage at the Hydromax™ Roof Drains?**  
A. HydroMax™ Siphonic Roof Drainage systems have a proven track record of low maintenance. As with a traditional gravity Roof Drain blockage or partial blockage should be avoided through the operation of a regular maintenance regime. The system is designed with high flow velocities in the pipework whereby there is a negative pressure within the pipework which sucks the water off the roof, also at high flow rates. Any small debris such as leaves, twigs, etc. will be pulled into the pipe system and flushed away. Please refer to our video to simulate a roof without maintenance  
<http://www.youtube.com/watch?v=eIxzigwmwx0&feature=plcp&context=C35cb421UDOEgsToP DskJT5udrAxd-XLGAvk6MWONB>
28. **How does the Hydromax™ Roof Drain protect against blockage from larger debris such as Dead Birds?**  
A. The Hydromax™ Roof Drain has been designed with Anti-Vortex fins which protrude from the flat plate of the Air-Baffle Inducer. Large Debris which do not get flushed through the roof drain will rest against these fins. Any water build up will flow over the obstruction and enter the roof

drain through the gap between the protruding fins and the Air-Baffle plate. It is recommended to operate a regular routine maintenance regime as with a Traditional Gravity Roof Drainage system.

29. [Is there a minimum roof area which can be drained by a Hydromax™ roof drain?](#)  
A. Yes. A minimum volume of water inflow into a Hydromax™ roof drain is required to “prime” the pipework down below. The various local standards dictate different minimum velocities which affect the volume of water that can be drained while maintaining flow above the minimum velocity. As a guide we suggest that to make the system operate, that you target an inflow of 1 litre per second (15.8GPM) although some pipe configurations will require more water than this. The minimum roof catchment area for a given project can be calculated from dividing the 1 l/s minimum flow by the project design rainfall intensity.

30. [Is there a maximum roof area which can be drained by a Hydromax™ roof drain?](#)  
A. Yes. The maximum operating water flow into our Hydromax™ roof drains are as follows:

Metric Drains:

50mm diameter – 10 litres per second (158.5 GPM)  
75mm diameter - 25 litres per second (396 GPM)  
125mm diameter – 100 litres per second (1585 GPM)

USA Range of Drains

3” diameter – 415 GPM  
4” diameter – 750 GPM  
5” diameter – 1300 GPM  
6” diameter – 1800 GPM

Please note that some pipe configurations will dictate less water than this. The maximum roof catchment area for a single outlet can be calculated from the dividing the l/s or GPM minimum flow by the project design rainfall intensity.

In our testing facility a Hydromax™ 75mm metric roof drain achieved a capacity of 32 l/s when operating using a 5 metre long vertical pipe. If a higher flow intake is required, please consult with our technical manager.

31. [Can a traditional gravity drain/pipe be connected into a siphonic system?](#)  
A. No, unless the pipe downstream from the point where the pipes connect is to be a gravity flow system. Gravity flow is approximately  $\frac{1}{3}$  water and  $\frac{2}{3}$  air. The air within the gravity pipe would disrupt the siphonic action.
32. [Can a Hydromax™ Siphonic Roof Drainage system connect into a gravity drainage system?](#)  
A. Yes but that would be the end (or transition) point of the siphonic system and the drain from the connection point onwards would have to be sized for traditional gravity flow with approximately  $\frac{1}{3}$  water and  $\frac{2}{3}$  air mix.
33. [Can a Hydromax™ Siphonic Roof Drainage system have a submerged discharge pipe e.g. into an attenuation pond?](#)  
A. Yes. Our advanced HydroTechnic™ analytical design program has a facility to calculate for a restricted (or submerged) discharge as required by ASPE Technical Design Standard 45 clause 4.7 and British Standard BS 8490:2007 clauses 8.4.6 & 8.4.7 . Please refer to our technical department for further details.
34. [Can a Hydromax™ Siphonic Roof Drainage system be altered?](#)  
A. A siphonic drainage system is a hydraulically engineered solution and therefore any alteration requires a hydraulic calculation to be carried out prior to making any changes.
35. [Can a Hydromax™ Siphonic Roof Drainage system be used to drain a car park/parking lot?](#)

- A. Hydromax™ can be used to drain the top deck of a multi-level car park which is the main rainfall catchment area. Being the top-deck it should also provide the height necessary to operate a siphonic system.
36. **Can a Hydromax™ Siphonic Roof Drainage system be used to drain pedestrian walk-ways?**  
A. If there is sufficient rainfall catchment area and adequate height to generate the siphonic action, Hydromax™ can be used for pedestrian walk-ways.
37. **Can a Hydromax™ Siphonic Roof Drainage system be used to drain bridges?**  
A. If there is sufficient rainfall catchment area and adequate height to generate the siphonic action, Hydromax™ can be used to drain bridges.
38. **How long does it take for a Hydromax™ Siphonic Roof Drainage system to start operating siphonically?**  
A. Our technically advanced HydroTechnic™ analytical design program calculates the Fill Time (Prime time) for each system. The parameters are set to limit the fill time to be under 60 seconds to ensure a rapid prime time as per British Standard BS 8490:2007 clause 6.7.
39. **Are access points/rodding points/clearing eyes required in the system?**  
A. No. Hydromax™ Siphonic Roof Drainage systems are designed to run full-bore at high velocities. This ensures that the pipes are self-cleaning. Access points would create air-pockets in the system which would disrupt the siphonic action. However, we recommend the installation of an access pipe on the vertical section of downpipe above finished ground level to provide a clearing facility of the below ground gravity drain. Please refer to our video to simulate a roof without maintenance  
<http://www.youtube.com/watch?v=eIxzigmwxw0&feature=plcp&context=C35cb421UDOEgsToPDskJT5udrAxd-XLGAvk6MWONB>
40. **Do any components need replacing due to wear and tear?**  
A. No there are no moving or mechanical parts in a Hydromax™ Siphonic Roof Drainage system therefore there should not be any necessity to replace any parts. It is recommended during routine maintenance that all roof drains are inspected to ensure all inducers are intact and good practice for the pipework be checked to see that the pipe supports are firmly fixed.
41. **Are overflows required?**  
A. The British Standards and American Local Codes call for overflow provision and we would always recommend the good practice of having an overflow provision for any roof drainage system whether it is a traditional gravity system or a Hydromax™ Siphonic Roof Drainage system.
42. **Can you have a single roof drain serving a roof area?**  
A. It is always good practice to have a minimum of two roof drains serving a single roof area or, alternatively, a single roof drain together with adequate overflow provision.
43. **What happens if the underground drainage system surcharges or is blocked?**  
A. We would always recommend the good practice of having overflow provision for any roof drainage system whether it is a traditional gravity system or a Hydromax™ Siphonic Roof Drainage system. This would provide a means of water escape should the underground drainage system be rendered inoperable. We also recommend that overflows are drained to air (atmosphere) as this provides a means to discharge if the underground drainage is surcharged or blocked.
44. **Can a Hydromax™ Siphonic Roof Drainage system accommodate future extensions to the building?**  
A. All siphonic roof drainage systems are designed to run to their maximum capacity and therefore have limited capability to carry an additional volume of water. However, we have been involved with a number of building extensions that incorporate new siphonic systems for the new extension part of the building and alterations to the existing siphonic systems to create the



optimum solution. Your Hydromax™ design engineer will work with you to find the best solution to your challenge.

45. [Is a siphonic system noisy during operation?](#)

A. It is impractical to attempt to simulate storm events to acoustically test an actual siphonic system. However, empirical acoustic tests within a testing facility recorded that the highest noise level was when the system was running at 50% capacity where there was an Air/Water mix similar to that which would be experienced within a gravity drainage system. The test concluded that the noise levels were not considered to be high.

46. [Does the Hydromax™ Siphonic Roof Drainage system suffer from vibration during operation?](#)

A. Not if installed properly. Whichever piping material is used, the installer should apply the fixings necessary to prevent vibration. Additionally, where our HDPE pipework is selected, this can be pre-fabricated to an engineered rail fastening system in a factory. This provides all the necessary vibration and thermal movement restraint necessary.

47. [Does condensation form on the pipework?](#)

A. This depends on a number of factors. Any pipework system can engender condensation given the right combination of factors which include 1) The thermal conductivity of the piping material, 2) Outside temperature/temperature of the rainwater, 3) Air temperature surrounding the pipework, 4) Humidity surrounding the pipework and 5) Duration of the storm event. The Hydromax™ design engineer should be consulted to assist in the determination of risk of condensation. It is well documented that HDPE pipes have an excellent inherent thermal insulating properties.

48. [Should the pipework be insulated?](#)

A. This is a subjective question. There are two forms of insulation: Acoustic Insulation and Thermal Insulation. To have insulation or not is very much dependent on clients choice, building characteristics, etc. The Hydromax™ design engineer should be consulted to assist in the determination of any insulation requirements. (We are unaware of any insulation ever having been retrospectively installed to any of our siphonic systems).

49. [Will there be standing water in horizontal pipework?](#)

A. No, apart from where there may be any minor construction tolerances, at the end of a rainfall event the rainwater will drain from the roof and the pipework will empty.

50. [What precautions can we take to prevent damage to underground pipework/manhole/chambers?](#)

A. Part of the Hydromax™ design engineers remit is to consult with the person responsible for the underground drainage design to assist in the determination of any risk and to work in tandem to design the best solution. Our advance HydroTechnic™ analytical design calculation program provides the flow volume and velocity at point of discharge to aid the design of the transition point. American ASPE Technical Design Standard 45:2007 clause 9.9.3 calls for a flare out to a diameter consistent with the Manning open channel flow formula at a distance of 10 times the siphonic discharge pipe diameter from the receiving manhole or catch pit.

51. [Should a long-radius bend \(below ground\) be installed at the base of the downpipe?](#)

A. Yes. All bends on a Hydromax™ Siphonic Roof Drainage system should be radius or 45° bends (other than immediately below the roof drain where a 90° bend is permitted as this promotes speedy priming).

52. [Can the pipework be painted? If so, what type of paint should be used?](#)

A. Painting of the pipework does not affect the hydraulic operation of the Hydromax™ Siphonic Roof Drainage system and therefore is wholly dependent on the selected piping material. Any paint should be chosen to suit the pipework and applied strictly in accordance with the paint manufacturer's guidelines.

53. [What pipe materials can be used in a Hydromax™ Siphonic Roof Drainage system?](#)

- A. Our advanced HydroTechnic™ analytical design software program can design a Hydromax™ system with any pipework that is suitable for carrying the volume of water at the design flow rates with the resulting negative pressures. For commercial reasons (together with the great range of pipe diameters available) HDPE is the most popular option although, cast iron, PVC Schedule 40 solid core or stainless steel (careful selection of jointing method required), etc. can be utilised.
54. [Can different piping materials be combined in a single Hydromax™ siphonic system?](#)  
A. Yes. Our technically advanced HydroTechnic™ analytical design program has the facility to design each pipework section with any suitable piping material.
55. [Are slopes/falls/pitch/gradients required to outlets in gutters?](#)  
A. No, the design engineer will locate the roof drains along the gutter length to achieve the optimum solution.
56. [Can a Hydromax™ Siphonic Roof Drainage system be used in sloping gutters?](#)  
A. Yes, using weirs or dams to channel to designed inflow into the drains and prevent the water flowing past the roof drains and sumps to provide a level base for the roof drain.
57. [Are roof-falls/gradients required to outlets in gutters/flat roofs?](#)  
A. The Hydromax™ Design engineer will position the roof drains to suit the configuration/slopes etc. of the roof as designed. If there are any additional considerations required, the design engineer will advise as necessary.
58. [Will the Hydromax™ roof drain/outlet operate if installed in a 'sump'?](#)  
A. Yes the Hydromax™ roof drain will operate if installed in a sump.
59. [Does the Hydromax™ roof drain/outlet require a 'sump' in order to operate?](#)  
A. No, although the Hydromax™ roof drain has a unique design which does not have an integral sump like some older design siphonic roof drains; it does not require a sump to operate.
60. [How wide should the gutter be?](#)  
A. Our most compact roof drain is 230mm diameter. Ideally, the gutter should be 30mm wider (260mm gutter sole) to provide flow around the drain and allow access for the roof drain to be installed. The Hydromax™ design engineer will also carry-out compatibility calculations using the Gutterflow software program.
61. [How much water will be in the gutter/on the roof when the system is operating?](#)  
A. The depth of water will be dependent on the volume of water the roof drain is discharging together with distance between roof drains. There will be a hydraulic gradient between roof drains whereby the deepest point will be mid-way between the two drains. The Hydromax™ design engineer will utilise the Gutterflow software program to calculate the depth of water on the roof or gutter and ensure it is within the required parameters.
62. [How does siphonic pipework operate as gravity drainage if pipework is horizontal \(no falls\)?](#)  
A. Although the pipework is level the pipes are self-draining except where there are minor structural tolerances which will not have any adverse affect.
63. [What happens if parts of the roof drain are removed or are missing?](#)  
A. All siphonic roof drainage systems require all the components to perform to the designed requirements. The Hydromax™ roof drain has a securely bolted one-piece inducer to reduce the risk of accidental loss. This also provides a means to readily identify any missing components to maintenance personnel. If a decent "head" of water can be built up at a roof drain which is missing an inducer, then the roof drain will perform albeit not to the designed level. A good maintenance regime should be in place to ensure all roof drains have the inducers installed.
64. [Can a Hydromax™ Siphonic Roof Drainage system be used on a Green or Garden Roof?](#)

A. Yes, however the design rainfall strategy must be carefully considered and providing there is sufficient volume of water to operate the Hydromax™ system. In most cases the soil will offer water retention but in some cases the soil could be fully saturated and consideration is required to determine if the design rainfall rate. Additionally, Green Roofs must be drained in siphonic systems separate from drains on areas which drain with no water retention. A roof drain with a barrier to prevent soil/ballast ingress into the drain should be detailed into the design. Please refer to our technical department for further details.

65. [Can gutter outlets \(and pipework\) freeze in cold conditions? \(Trace heating?\)](#)

A. Any roof drain, whether it is a gravity roof drain or Hydromax™, operating in sub-zero temperatures where water is melting due to the action of the sun, can potentially suffer from blockage problems. If it is considered that there is a risk of freezing in the building location, trace heating of the roof drains should be considered. Please note that on primary systems draining directly into below ground drainage systems, the heat from the ground causes warm air to rise through the piping system and causes a thaw around the roof drain.



66. [Can blockages occur due to snow?](#)

A. There will be no flow from the roof when it is covered with snow, but at the time when it melts, the high capacity of the Hydromax™ Siphonic Roof Drainage system will ensure that melt water is safely removed. Additionally, on Primary drainage systems connected to a below ground drainage system, the heat from the ground rises through the piping system and melts the snow at the drain.

67. [Can a Hydromax™ Siphonic Roof Drainage system incorporate sloping pipework?](#)

A. Sloping pipework can be incorporated into a Hydromax™ Siphonic Roof Drainage system, but careful detailing is required to ensure full system functionality. Your Hydromax™ design engineer will work with you to find the best solution to your challenge.