

Preventing Roof Drain Failures

Siphonic Drains

Standard strainers on Siphonic drains that are connected to a common leader

The problem with this is that if the strainer on one of the drain heads on the common leader becomes plugged with debris, say 3" to 4" up the strainer, then the water would not get to the drain head and it would allow air to enter the system through the top of the strainer. This would prevent the drains on this leader from self-equalizing and going siphonic. The system would be better off if the strainers were not there and the siphonic baffle were to become plugged because then only that drain head would be affected and not that entire leader because the blocked head would not allow air into the system. Now a debris guard is different than a strainer and has much larger openings and would not have the same effect as a strainer.

Not fully understanding the requirement for free flowing to common leader drain heads can lead the design engineer into trouble. The standard states to minimize the cricketing in the roof, well cricketing diverts water that is what it does so it can't be minimized to allow for free flowing of water it has to be eliminated. I understand the need for this but the problem is a dead flat roof area does not eliminate ponding water and ponding water effects roofing systems warranties so you need to have an in-depth discussion with the architect and membrane manufacturer on how this issue is going to be achieved. Keep in mind that positive slope is a building code requirement and may require approval from the building code official not just the plumbing official.

Then what happens at reroof time who is going to train the roofer to deal with this system?

Gravity Drains

Never put screens over any kind of roof drain unless there is a very defined maintenance schedule for the roof. Screens can cause drains to plug within an hour if the debris conditions are right. So, if there is an overflow system with the same screens on them the roof drainage can fail in as quickly as two hours. There is no harm in allowing debris to be washed off the roof under sufficient GPM rates to carry the debris clear of the system.

The roof drain needs to be installed so that its free drainage height is level with or below the surrounding roof insulation. For the last hundred years the drain has been installed with the sump flange level with the insulation and this is wrong! The drain needs to be installed so that it does not hold back water around the drain with will trap debris and cause the drain to plug over time. One of the problems with this you have no idea at what height the drain starts to flow water. The industry average is 5/8' to 7/8" with the worst case being 1 full inch. Believe it or not making sure that the drain is installed so that it

does not hold back water can basically eliminate blocked strainers. The major cause of roof drain failures. Oh, by the way our drains flow at a 1/4".

Green roof drains should never have an enclosure attached directly to the drain that puts perforated S/S in the primary drainage path. The drainage mat under the green roof must be allowed to flow freely into the roof drain without any obstruction. A green roof is a debris creator and the perforated S/S plugs very quickly. Keep in mind that roof drains are hardly maintained when they are in full view when on the roof. So put them under a green roof within an enclosure and they will never be looked at. The water that is no longer flowing to the drain is hidden under the green roof ponding and causing the roof membrane to prematurely fail. You know how expensive it is to install a green roof, well just think how expensive it is to remove and replace one. This needs to be done right or there will be a big liability.

Primary and secondary drain with one common strainer

If the strainer on this type of drain were to become blocked there is no way for the secondary system to activate because the same strainer that is blocking the primary drain blocks it. Then if you read the structural code it states that the structure must be designed for the depth of the water caused by the blocked primary strainer to the point of relief, which would be the top of the parapet wall surrounding the roof area. Why because the secondary inlet is blocked under the primary strainer. So, you did have this talk with the structural engineer, right?

With all this said a lot of the problems come from what is the grey area of the roof drain the ARCH/ENG, the ROOFER/PLUMBER. I have always viewed the roof drain to be a roofing fixture not a plumbing fixture. There are a whole lot more things that need to be addressed in regard to the roofing then that of connecting to a pipe. Don't get me wrong the plumbing engineer must design the drainage system and it is important to get that correct. What I am trying to put emphasis on is after the plumbing engineer does his work let's not get it all messed up with the installation of the roofing system.