pool engineering inc.

VANISHING EDGE POOLS

Due to the numerous requests received by Pool Engineering, Inc. for information on the finer points involved in the design and construction of vanishing edge pools, available published information has been reviewed and summarized herein. Please be advised that the information contained herein is based only on review of published information and no warranty is intended or implied on the part of Pool Engineering, Inc. for the this information.

Basin volume

The most common problem experienced with vanishing edge pools is that the basin is constructed with too little volume. It is always better to have a basin that is too big rather than too small. The minimum basin volume should be based on the sum of the following

1. Minimum operating level in the basin

   A 1 ft. minimum depth of water is commonly recommended over the suction inlets in the catch basin to reduce the possibility of suction vortexing over the inlets and to provide a margin of safety against the pump sucking the basin dry and ruining the pump. This volume would therefore be 1 foot x the area of the basin.

2. Water in transit

   When the dedicated vanishing edge pump is shut off, the water level in the pool will drop to the lowest level of the top of the spillway. Water in transit is the amount of water that must be pumped from the basin to the pool to raise the pools water surface to the level where water begins to flow over the spillway. Depending on the tolerances of the spillway height (should be +/- 1/8 inch), the water level in the pool will have to raise up roughly ¼ inch above the spillway before the vanishing edge begins to flow over the entire spillway. Based on this, the water in transit volume should be at least ¼ inch of depth over the entire pool area.

3. Daily water loss due to evaporation

   This, of course, is based on the climatic conditions of the pool's location. In most warm dry areas such as the western United States ¼ inch of daily water loss could be expected from evaporation. Based on this, the water loss due to evaporation should be at least ¼ inch of depth over the entire pool and basin

area. If the vanishing edge is not operated daily, a larger volume should be used.

4. Bather and splash water loss

Anticipated use of the pool should be taken into consideration for calculation of bather and splash water loss. For example, a small pool used by a large family would generate a larger bather and splash water loss than would a large pool used by a small family. Experienced builders have found that 2 inches of water loss over the spillway can occur from bather and splash water loss. Based on this, the water loss due to bather and splash should be at least 2 inches of depth over the entire pool area.

Back flow preventation

One of the most serious potential problems with vanishing edge pools is the possibility that the pool will siphon or back drain into the basin when the basin pump is not running. Since the pool has a much greater volume, catastrophic damage is possible when 20,000 to 40,000 gallons of water back flows to and overflows the basin.

Fortunately, this potential problem can be eliminated by the installation of a hartford loop. A hartford loop is simply the installation of a section of the basin to pool return line that loops above ground (and the pool's highest level). A vacuum breaker (back flow preventer) is then installed in the loop which allows air to enter the pipe when the pump is off and stop the possibility of back flow.

Another possible solution is to plumb the basin's return line to an above pool level water feature. Because the water feature is above the pool's waterline, there would be no possibility of back flow.

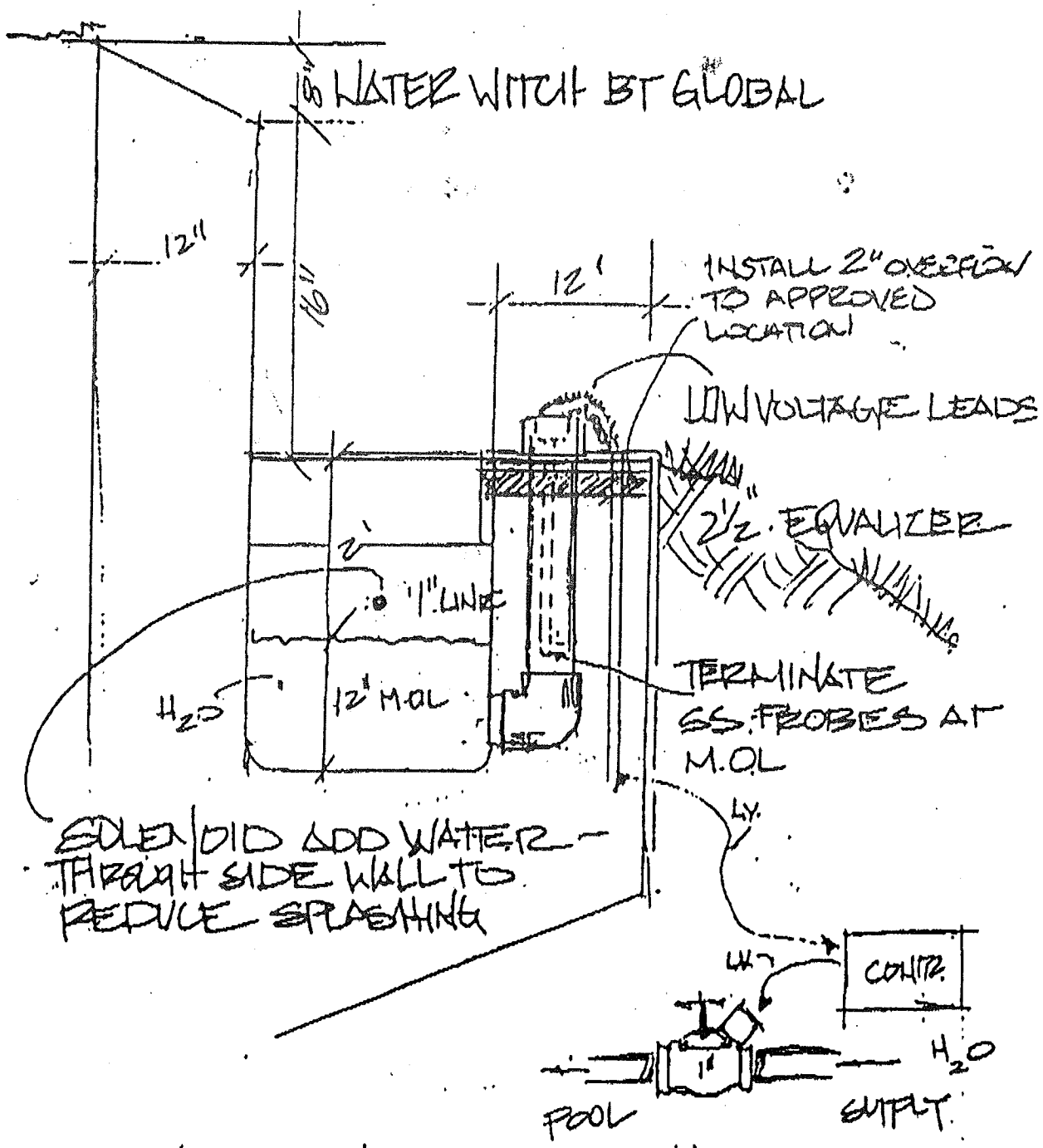
Other Important Details

1. Minimize splash and water loss from spillway into basin

The basin should be at least as wide (distance out from the spillway) as it is lower than the spillway. The basin should extend a foot so beyond both sides of the spillway.

2. Basin sized to allow access for cleaning and maintenance

Basin dimensions must be sufficient for easy access. For example a deep narrow basin would not readily permit pool service men access to the plumbing in the floor of the basin.


WATER WITCH BY GLOBAL
12"
16"
12'
INSTALL 2" OVERFLOW TO APPROVED LOCATION
LOW VOLTAGE LEADS
2½" EQUALIZER
2'
1" LINE
H_2O
12' M.O.L.
TERMINATE SS PROBES AT M.O.L.
SOLENOID ADD WATER THRU SIDE WALL TO REDUCE SPLASHING
LV.
CONTR.
LV.
1"
H_2O
POOL
SUPPLY
RAIN BIRD 100 EFB-CP
BACK @ EQUIPMENT

A4 AUTO FILL

3. Auto fill system in the catch basin (not recommended in the pool)

   Electronic devises such as the Water Witch by Global operating a solenoid valve is strongly recommended over mechanical float valves (see schematic next page). Global Industries can be contacted at 7655 E. Evans Road, # 7, Scottsdale, AZ 85260, (800) 962-3445

4. Dedicated pump and filter for operation of the vanishing edge

   The pump should be located at the same level as the basin and should be sized to provide a flow rate of 5 gal. per minute per foot of spillway.

5. Basin overflow system

   Either a gravity overflow or an electronically controlled sump pump must be installed to prevent overflow of the basin and flooding downhill of the basin in the event of excessive rainfall or bather load.

6. Pump suction system in basin

   Suction piping should be oversized to prevent velocity cavitation due to high flows from low head operation. Multiple main drain outlets should be provided in the basin floor or low wall location with anti vortex covers to minimize velocity and the resultant vortexing over the outlets.

7. Return system in the pool

   Minimizing surface turbulence is an important factor in achieving a crisp flow over the spillway. Both the pool circulation system inlets and the vanishing edge system inlets into the pool should be located to minimize turbulence to the pool's surface.