

PUBLIC WORKS ENGINEERING

BASEMENT EXTERIOR DRAINAGE POLICY

EFFECTIVE OCTOBER 1, 2006

Policy

The Department of Public Works (Public Works) will not permit the use of basement exterior drainage systems consisting of perforated pipes located on the exterior of the basement walls or underneath the slab that collect water which is then pumped to the surface of the ground for discharge, either on-site or off-site, for all City of Palo Alto parcels northeast (the bay side) of Foothill Expressway.

Purpose

To protect the public safety and health by preventing the discharge of groundwater into the City gutter system. The discharge of groundwater into the gutter system causes the following public safety, health and nuisance concerns:

- gutters are constantly wet and may enhance the growth of algae, thereby creating a slippery condition for pedestrians, bicyclists and motorists
- ponded water at the low spots of the gutter may be slippery to cross for pedestrians, bicyclists and motorists
- ponded water in the gutter may become mosquito habitat
- ponded water in the gutter may seep through cracks, undermining the subgrade and degrading the gutter and adjacent pavement
- groundwater discharge into the City's storm drain system adversely affects the capacity of the system to convey the storm water run-off for which the system was designed

Background

In the past, Public Works allowed perforated pipe basement drainage systems to collect water behind basement walls and under basement slabs and discharge it at the ground. Architects proposed these systems in order to minimize the chances of water leakage through the basement walls and slabs. These systems were permitted with the intention of only collecting and discharging small amounts of rainwater that had seeped down through the soil. For proposed basement drainage systems, Public Works required geotechnical reports that estimated the highest expected groundwater level at the site and Public Works required that the perforated pipes be placed above this level. Recent experience indicates that oftentimes the groundwater level rose above the estimated level and entered the perforated pipes, resulting in the constant pumping of groundwater into the street gutter.

Analysis

Public Works has obtained a groundwater elevation contour map from the Santa Clara Valley Water District. These maps were established using data from numerous water monitoring wells the SCVWD maintains throughout the City. The contours are the depth below ground to the highest level the main groundwater aquifer has risen to since the monitoring wells were installed.

The area of town where there is relatively high groundwater (above 20 feet below-grade) is roughly northeast of Foothill Expressway.


The main aquifer depicted in the contour map is not the only source of groundwater. Due to soil properties, groundwater can get trapped between two relatively impermeable layers of soil. These lenses of perched groundwater can occur essentially anywhere and be of any size. Consequently, even though the SCVWD map may indicate a certain area of town has groundwater at 20 feet below-grade, for instance, there may currently be perched water closer to the surface or perched water may occur in the future closer to the surface.

Summary

Based on this information, Public Works concludes that the public safety and health, potential nuisance, and maintenance concerns caused by the discharge of groundwater into street gutters outweigh the developers' desire for perforated pipe drainage systems. Although certain sites may seem appropriate for perforated pipe drainage systems because of current low groundwater levels, higher groundwater levels may occur in the future. Accordingly, Public Works will no longer permit perforated pipe basement drainage systems installed in order to discharge water at the ground surface northeast of Foothill Expressway.

Note

Drainage systems are required and will be permitted for basement-level exterior spaces, such as stairwells, lightwells and patios. These drainage systems consist of a sump, a sump pump, and a closed pipe from the pump to a dissipation device onsite, such as a bubbler box in a landscaped area, so that water can percolate into the soil and/or sheet flow across the site. The device must not allow stagnant water to occur that could become mosquito habitat. Additionally, the plans must show 8" of freeboard between the floor of any exterior basement-level space and any adjacent windowsills or doorsills.



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