

MEMORANDUM

DATE: May 7, 2009

TO: Karie Friling – Director of Development Services

CC: Development Services and Planning Committee

FROM: Travis Parry, EI, CFM
Thomas T. Burke, PhD, PE

SUBJECT: Swimming Pools and Lot Coverage Calculations
(CBBEL Project No. 04-389)

The purpose of this memorandum is to provide information and recommendations to the Village of Orland Park (Village) regarding the recurring issues of lot coverage, pervious/impervious surfaces and their impacts on stormwater management.

History

In April of 2006, Christopher B. Burke Engineering, Ltd. (CBBEL) prepared a similar memorandum to address letters provided to the Village by a swimming pool contractor from two industry professionals stating that in their opinion swimming pools should be considered pervious surfaces since they collect stormwater runoff to some degree before overflowing. At that time, CBBEL recommended two options for the Village's consideration in addressing the pool lot coverage issue. The recommendations were 1) allow a 5% increase (from 35% to 40%) in lot coverage for accessory structures including swimming pools or 2) allow a portion (i.e. 50%) of the swimming pool surface area to be considered pervious when calculating lot coverage. Since there are several variables associated with allowing a certain percentage of swimming pools to be considered pervious, such as depth of available storage, direct connection to storm sewers, dedicated overland flow routes, presence of pool covers, etc., CBBEL recommended, and the Village ultimately approved, the option to increase the lot coverage by 5%.

The purpose of the recommendation to allow an increase in the lot coverage was to strike a balance between the existing criteria used to determine stormwater runoff requirements and the desires of the Village to fairly and accurately monitor development. As such, CBBEL does not recommend allowing an additional credit for the small amount of storage that may exist in some swimming pools between the normal water level and the overflow. The percentage lot coverage increase option and the swimming pool credit allowance option should be viewed as comparable alternatives that are treated as an either/or scenario to consider, but both options should not be used together.



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Lot Coverage and Detention (Pervious/Impervious)

Although lot coverage regulations and pervious/impervious requirements for stormwater detention of a property are invariably linked, they should not be considered one in the same. Lot coverage is a calculation to define that portion of a lot that is covered by impervious surfaces. While there are a number of ancillary benefits to regulating lot coverage, the primary purpose for limiting the amount of impervious surface is to regulate the size of the footprint of development (house, garage, driveway, etc.) that can be placed on a property, with no calculated relationship between the lot coverage allowance and stormwater runoff infiltration. Stormwater detention requirements are based on the runoff generated by the impervious surface of a given development. Stormwater runoff rates and detention requirements for residential developments are based on the size of the lot of the typical impervious coverage associated with that lot size. Calculations determine a specified infiltration rate for a given soil moisture condition that will accept stormwater to a given point before beginning to produce runoff. Essentially, while lot coverage regulations are not intended to directly require a specified amount of infiltration, an increase in the amount of impervious surface allowed on a lot is inherently tied to infiltration and decreases a developed lot's ability to accept stormwater. This in turn alters the required stormwater runoff volumes that are based on statistical values for proposed developments and their impervious surfaces. As a result, both lot coverage regulations and stormwater detention requirements serve to preserve open space, promote infiltration and protect residents from the impacts of development, but the intrinsic nature of each policy is to serve separate and equally important purpose.

Porous Pavement Alternatives

Under current regulations, the Village allows a 50% credit for the use of porous pavement systems on single family lots. The credit can be used on driveways, sidewalks, decks, etc., as long as they provide a porous surface, an appropriate subgrade to promote infiltration and an underdrain system to remove excess runoff from the surface. Current porous technologies available include pavers, concrete, asphalt, among others and each type comes with a specific infiltration rate based on the porous surface, as well as its own unique set of positives and negatives. Consistent among all the porous technologies is that they are extremely installation sensitive, which directly impacts their ability to function as designed and achieve their specified peak infiltration rate. The installation sensitivity and resulting inconsistency in the infiltration rates are the primary reasons that a standard 50% credit is applied regardless of the type of porous system used despite laboratory data from the individual manufacturers indicating variations. Until technologies are improved to provide for an improved analysis technique or standard installation methods are developed, CBBEL recommends adhering to the 50% standard credit allowance for porous systems on single lots.



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It should also be noted that the requirements associated with a single family lot porous system are vastly different from those of a large development due to the varying intent of the stormwater management requirements. As previously mentioned, the purpose of porous systems on single family lots is to promote infiltration of stormwater runoff to offset the addition of impervious surfaces. Large scale developments that use porous pavement as a best management practice are employing the system to first reduce the runoff coefficient of the site, since porous systems are similar to developed open space in this regard, which reduces the total amount of stormwater detention storage required, and secondly to utilize the storage in the voids below the porous surface for a portion of the required detention storage volume. As a result, the requirements regarding the design, engineering, plans, specifications and details, construction and inspection are vastly different for the two types of systems as well. Based on discussions with Village staff and the performance of both of these types of systems to date, CBEL recommends maintaining the current system that employs two sets of standards for single family and large scale developments based on the intent of the stormwater management requirements given the type of development.

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MEMORANDUM

DATE April 10, 2006

TO: Karie Friling – Director of Development Services, Village of Orland Park

CC: Barbara Lynch – Building Information Coordinator, Village of Orland Park

FROM: Travis M. Parry, EI, CFM
Thomas T. Burke, PhD, PE

SUBJECT: Swimming Pool and Impervious Surface/Lot Coverage Calculations
(CBBEL Project No. 04-389)

As requested, Christopher B. Burke Engineering, Ltd. (CBBEL) has reviewed the letters provided to the Village of Orland Park (Village) by Richard P. Kipp, P.E. and Dale B. Carter, Licensed Architect, regarding impervious surface calculations for swimming pools. The two letters contend that the pool footprint should not be included in the impervious surface calculations because the pools have sufficient capacity to store any runoff generated by the pool. The Village has asked for CBBEL to provide a response to the letters and to provide recommendations on how to address the issues raised by letters.

When considering the impacts of constructing inground swimming pools, there are several issues that need to be addressed, however, the primary concerns are stormwater runoff and lot coverage. Regarding the stormwater runoff, CBBEL does not have any issues with the line of reasoning presented in the letters. Within the majority of swimming pools, there will be a small amount of storage available to accommodate the rainfall within the pool footprint. Once the pool is full, the pool water and stormwater will begin to flow overland and should be conveyed via overland flow routes. This scenario is similar to pervious surfaces, such as lawns, that will initially absorb a small amount of stormwater runoff and then become saturated. Once the lawn is saturated, the stormwater runoff will begin to flow overland and should be conveyed via overland flow routes. It is our opinion that under properly designed circumstances, the stormwater runoff aspect of swimming pool construction is negligible and can safely be accommodated under existing design and review procedures.

Historically, the Village has included the footprint of swimming pools in the impervious surface area calculation for lot coverage. Since it is our opinion that the stormwater runoff is a separate issue, CBBEL contacted several other communities that we represent which are similar to the Village regarding their lot coverage policy. Provided below is a list of the communities contacted and a summary of their impervious policy.

- Carol Stream – Allows 30% impervious coverage for the building and 5% impervious coverage for everything else.



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- Flossmoor – Allows 30% impervious coverage for the building only and has no restrictions on any other impervious surfaces including sidewalks and swimming pools, except swimming pools and basketball courts. Swimming pools and basketball courts are considered Special Uses and require a variance from the Board on a case by case basis.
- Naperville – Allows a total of 30% of the lot to be impervious with no exceptions for the addition of swimming pools, sheds, sidewalks, etc.
- Northbrook – Allows a total of 50% of the lot to be impervious with no exceptions for the addition of swimming pools, sheds, sidewalks, etc.

In general, the communities contacted are either very relaxed or very strict in the application of the lot coverage policy. CBBEL recommends a compromise to accommodate the desires of the Village limit lot coverage and the wishes of the residents to have pools constructed. Two possible compromises are to allow a percentage of the swimming pool to be considered pervious or to allow a percentage increase in impervious lot coverage based on the size of the lot. CBBEL endorses both of the compromises provided above and recommends allowing 50% of the swimming pool surface area to be calculated as pervious and a 5% increase in lot coverage. Ultimately, however, the decision to permit residents to exceed the lot coverage percentages currently allowed by the Land Development Code will not significantly impact stormwater runoff and should be considered a policy decision for the Village Board.

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Survey of Other Communities Pool Requirements

Tinley Park – Tinley uses a 35% lot coverage percentage. This includes all structures with 4 walls and a roof. Pools, patios, decks, etc., are not counted against the 35%. The only restriction for inground pools relates to setbacks.

New Lenox – No more than 40% of the rear yard may be covered with accessory structures.

Mokena – No impervious surface requirement for accessory structures. The only restriction for inground pools relates to setbacks.

Frankfort – Their zoning ordinance has two different percentages, one for the lot as a whole to cover the building of the house, and the second number is for the rear yard only to cover accessory structures. The impervious surface percentage for the lot which covers construction of the house ranges from 30% to 40% to cover the 5 different zoning districts. The impervious surface figure for the rear yard only ranges from 20 to 30% additionally.

Oak Brook – No restrictions in their zoning ordinance that governs lot coverage as it relates to accessory structures.

Downers Grove – No restrictions on lot coverage.

Plainfield – Accessory structures can occupy up to 25% of required rear or side yard.

LaGrange – No restrictions on lot coverage unless the accessory structure has a roof over it.

Homer Glen – 40% lot coverage – they do give a 50% credit for the swimming pool itself.

Carol Stream – 30%, goes up to 35% to include accessory structures such as pools and decks. Driveways are not included in any calculations and not considered accessory structures.

Flossmoor – 30% for house itself. Extra 10% for accessory structures such as detached garages and sheds. Do not count inground pools, driveways or patios in lot coverage calculations.

Naperville – 35% which is strictly for the house itself. Inground pools, driveways, and patios are not included in the 35% calculation.

Northbrook – 35%-50% - maximum allowed for building footprint.