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Driveways

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Introduction

Driveways are vehicle access ways between a street and an abutting property. In low-density residential areas, driveways are often single lane paved areas connecting a carport, garage or off-street parking area and a street. In high-density residential, commercial and industrial areas, driveways lead to off-street parking lots or loading areas. Driveways are sometimes used as emergency access ways.

While often viewed as a necessary component of the passenger car transport network, research shows that driveways are a hot spot for the accumulation and conveyance of non-point source pollutants. When Bannerman and his colleagues collected runoff samples from various source areas in the Wisconsin urban landscape, they found significant concentrations of phosphorus, suspended solids, fecal coliform and several metals generated by driveways. Driveways, as non-point source generators, are strongly influenced by the emissions, leaks and deteriorating metal parts from the cars using them. In addition, driveways are used as work and play areas. Activities such as washing, repairing and maintaining vehicles and equipment often take place on the driveway. When used as the work area for changing the family car's oil or washing grass off the lawnmower, inevitable spills and deposits are stored on the driveway's surface and washed by the next rainfall to receiving roads, curbs and curtain drains. When gutters and down spouts are directed to driveways, the volume, velocity and pollutant load of driveway runoff increases.

Driveway Design

Driveway design can range from the minimum needed to be practical and safe to a maximum to assure ease of driving and parking. Many communities, as part of their subdivision and zoning regulations establish minimum design requirements for driveways. If a proposed lot cannot be served by a driveway meeting adopted standards, it will not be approved. Most regulations address driveway location, grading, erosion control, drainage and construction details. As a general rule, driveways should be designed to be as narrow, short and few as possible. Driveways are either straight or curved, with single or multiple lanes. The

common driveway types are the single slab, made of asphalt or concrete, and ribbon, made of two parallel strips of pavement with grass or stone in between. The single slab is more common as ribbon drives are deemed impractical where the driveway is long or curved.

The entrance to a typical passenger car driveway requires an inside radius of 18 feet and an outside radius or sweep path of 30' for a 90° turn. Improper grading of the area where the driveway crosses over the right-of-way will result in rear bumper scuffing. As a general rule, the driveway grade should not exceed 8 percent within the right-of-way area. Most communities establish maximum grades of unpaved driveways ranging from 7 percent to 10 percent. Andover, Connecticut guests shared drives be approximately 12' to 16' wide or just wide enough for two cars to pass. An alternative design for shared drives, is a 10' drive that is wider at intervals to allow cars to pass one another.

Driveway Width

Some communities such as Guilford, Connecticut establish minimum widths for driveway rights-of-way as well as minimum travel and cleared ways. Guilford requires that driveways have a minimum travel way of 12', a cleared way of 16' and a 20' right-of-way.

Straight driveways leading to attached garages, located near the street, on level sites, can be as narrow as 7' 8", however many communities require 10' to 12'. A width of 9' is usually more than adequate, for comfortable and safe driving and parking. Communities should consider placing maximum widths of 14' or less on driveways. The recommended width of the most common type of driveway, the single slab, is 9' however, in some instances 8' will work. The concrete strips in a ribbon driveway should both be at least 2' wide and located so they are separated, 5' on center.

As the minimum safe clearance between two moving cars is two feet, a double lane straight drive could be as narrow as 17'4", however 18' is often the suggested minimum width.

The design of curved driveways is based on four factors; the distance center-to-center of the front or rear wheels, the distance between the front and rear axles, the turning radius of the outer front wheel and the area needed to provide safe clearance from vegetation or walls bordering the drive. Curved driveways require that lanes be least 9' wide.

If a lip of the driveway is used as a walkway, a minimum of two additional feet should be added to the suggested minimum driveway width. For ribbon driveways also used as walks, the width of the strips should be widened from 2' to 3'.

Driveway Length

Driveway length is often directly related to front yard setback requirements found in the local zoning regulations. For example, if local zoning requires a 50' front yard, a driveway at least 50' long will be needed to connect the garage and the street. If circular drives are installed, they will generally be longer than straight ones.

The Town of Ashford, Connecticut requires that any driveway with a positive slope of 10 percent or greater, be paved to a minimum distance of 60' from the edge of the highway.

Avon, Connecticut limits the length of driveways serving rear lots to 1000' and requires that they have an adequate all weather surface for their entire length. Guilford, Connecticut limits driveway lengths to 750'.

Driveway Surface Materials

Driveways with grades of less than 7 percent may not need pavement while those greater than 7 percent should have some type of surfacing to prevent erosion. Guilford, Connecticut's minimal construction standard for unpaved driveways is a sub-base of 8" of bank run gravel covered with 3" of processed stone.

Two types of paved driveways are slab and ribbon. The most common driveway is the full width; single slab made of asphalt or concrete. The Asphalt Institute recommends that full width, single slab, asphalt, driveways built on gravelly, well drained, frost-susceptible soils, have a minimum of 1" asphalt concrete surface course, a 2" to 3" asphalt base course and a 3" to 4" sub-grade, built to local specifications.

The "ribbon" driveway consists of two 2' strips of pavement with grass in between. The ribbon drive is cheaper to install, is less conspicuous and is contains less impervious surface. However, some feel ribbon designs are impractical where driveways are long or curved.

Driveway Imperviousness

As a significant component of a community's impervious surface coverage and a recognized generator of polluted runoff, communities should be concerned about impervious driveways. The potential adverse impacts of impervious driveways on water

resources can be reduced by; limiting the size and number of driveways, limiting their imperviousness and directing driveway runoff to porous surfaces.

The number and size of impervious driveways found in a community is often related to minimum standards found in local zoning and subdivision regulations and road ordinances. Local land use officials should review these standards to determine if they are flexible enough to allow creative design regarding the number and size of drives and permitted surface materials.

Many local driveway regulations stipulate they be constructed with impervious surfaces. There are numerous porous surfaces that work well on driveways and local regulations should permit their use. Examples of porous driveway surfaces include; porous concrete and asphalt mixtures, paver blocks and brick set in sand, grass pavers, grid pavers, crushed stone and gravel. The key to the use of porous driveway surfaces is the installation of a sub-base specifically designed for the surface material used. The sub base must also be capable of promoting infiltration and runoff cleansing.

If impervious driveway surfaces must be installed, they should be crowned and pitched to direct runoff flow to adjacent porous areas such as grass, vegetated swales or filter strips. Roof runoff should not flow over driveways but be directed to grass, dry wells or gardens designed as bioretention areas.

No driveway should obstruct the flow of storm water along the road or through drainage ditches, culverts or conduits.

Where feasible try to disrupt the impervious connection of driveways, to roads, curbs, storm drains and pipes. This can be accomplished through the use of porous surface material along the entire drive or in the area where the driveway intersects the road. Andover, Connecticut stipulates that driveways be designed to prevent runoff from entering public rights-of-way by installing privately owned and maintained drainage diversion swales, retention areas, or dry wells. Before a certificate of occupancy is issued, a deed stipulation, approved by the Town Attorney, must be filed in the land records clearly establishing land owner responsibility to maintain the driveway related swale, retention facility or dry well.

NEMO Recommendations Regarding Driveways

- Initiate a public educational program highlighting the potential adverse impacts of impervious surfaces, such as driveways, on water resources.
- Educate the public on the adverse impacts on water of such driveway activities as car and lawn mower washing and changing engine oil.
- Do not allow roof gutters and downspouts to drain over impervious driveways.
- Allow and promote the use of porous driveway surfaces, including; porous asphalt and concrete mixtures, paver blocks and bricks laid in sand, concrete and grass grid pavers, crushed stone and gravel.

- Review local zoning and subdivision regulations, and road and driveway ordinances to determine if they promote long and wide impervious driveways. Revise as needed.
- As a general planning principle, keep the number of driveways to a minimum and as short, narrow, and porous as possible.
- Limit driveway curb cuts to one per site.
- Allow shared driveways to serve commercial areas and up to four single-family lots.
- Establish maximum limits on paved driveway lengths.
- Establish maximum limits on paved driveway widths
- Establish maximum limits on paved driveway curb cut widths.
- Minimize driveway-sidewalk crossings.
- Establish minimum setbacks for driveway curb cuts near road intersections.
- Allow various driveway designs, including ribbon drives that contain less impervious surface than the more common full width, single slab, drive.
- Allow single lane straight drives to be 8' or 9' wide and double lane drives to be 18'.
- Promote the use of driveway lips as front yard walks to reduce the imperviousness of a separate walk system. If a separate walk is proposed, have it be built of porous surface materials or impervious surfaces that drain to adjacent porous areas.
- Where impervious driveway surfaces are installed they should be crowned and pitched to direct runoff to adjacent porous areas.
- Where impervious driveway surfaces are installed, disrupt their connection to roads, curbs and curtain drains with porous materials in the area where the drive intersects the road.
- Permit the use of gravel driveways in low density, level areas.
- Where porous driveway surfaces are used, insure that a proper sub base, capable of infiltrating and cleansing storm water runoff is installed.
- Whatever type of driveway is installed, it should never obstruct existing storm water flows along the road or through drainage facilities.

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