

# Pender County Planning and Community Development

## Planning Division

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## MEMORANDUM

To: Pender County Planning Board

From: Planning Staff

Date: December 1, 2015

RE: Cul-de-sac Radius

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Staff has prepared and will be presenting to you information on cul-de-sac radius and turn around requirements on public and private roadways. Planning Board previously discussed presenting potential cul-de-sac radius amendments on June 3, 2014 and the Board had previously concluded that the Pender County Unified Development Ordinance requirements met the needs of the community as written and if a larger cul-de-sac radius was deemed necessary during the Pender County Technical Review process then each should be evaluated on a case-by-case basis.

The Pender County Unified Development Ordinance Section 7.5.1 F specifies:

*Permanent dead end streets (cul-de-sacs) or temporary dead end (stub) streets shall be no longer than 1,000 ft. unless it is demonstrated by the developer that the configuration of the property prevents its development without longer streets to provide access to the lots and common area to be subdivided. Temporary dead end or stub streets shall provide turn around capabilities to meet NCDOT requirements. The Cul-de-sac end shall be a bulb type with minimum radii as follows: Curb & Gutter Section: RW = 45', Pavement = 37' to gutter edge, Shoulder Section: RW = 50', Pavement = 35'.*

There are however, inherent conditions that are specific to each development which may necessitate a larger cul-de-sac than NCDOT requirements and Pender County Unified Development Ordinance minimum requirements. Conditions that may require a larger cul-de-sac could be school bus accessibility and fire apparatus accessibility. According to Pender County Schools, buses are required to stop per quarter mile and may not need to utilize each cul-de-sac in a development; some cul-de-sacs may need to be larger to accommodate the school buses. Additionally, Pender County Emergency Management staff indicated that fire trucks and emergency vehicles may require additional area to turn around above and beyond the NCDOT minimum requirements.

In such situations, during the Technical Review process Emergency Management staff is encouraged to work with the applicant to properly service the development. Any and all turn around or cul-de-sac is subject to NCDOT requirements and approvals. In many instances a forty (40) foot cul-de-sac has been requested by the Pender County School System and Fire Marshal during the Pender County Technical Review meetings. Although this is a request from the Pender County Fire Marshal, the application of the

forty (40) foot cul-de-sac is currently not enforceable through Planning Staff. Only the thirty-five (35) foot cul-de-sac Per Section 7.5.1 F would be enforceable by Pender County. Clarity in recent months during Pender County Technical Review has been requested concerning cul-de-sac radius requirements.

Staff met with the Fire Marshal and Deputy Fire Marshal on October 27, 2015, to discuss further changes that may be applied to the Pender County Unified Development Ordinance to provide clarity to applicants and Technical Review Committee members. It is Staff’s recommendation that the Pender County Unified Development Ordinance text be modified to allow for specific evaluation of each cul-de-sac and greater clarity for the applicant while meeting the needs of Pender County Schools and Emergency Management.

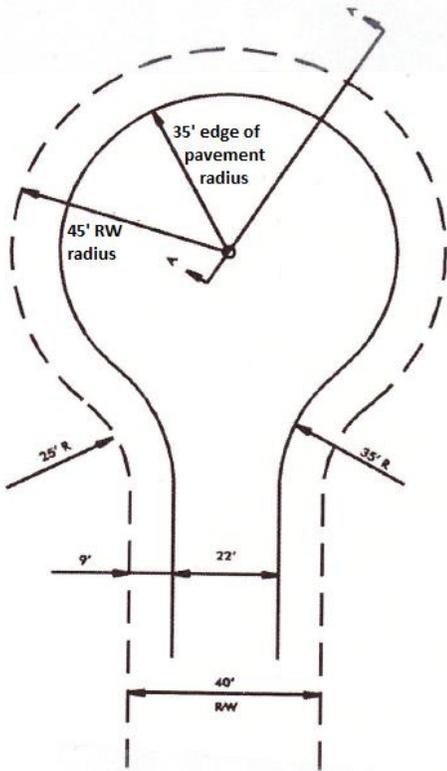
Distinguishing between specific lengths could help clarify the regulations. Suggested amendments for the Pender County Unified Development Ordinance Section 7.5.1 F includes distinguishing varying lengths of a permanent dead end street to then require a larger bulb for Emergency Management and school bus turn around. The length of a cul-de-sac will be measured from the last point of alternative connected access.

**Table 1**

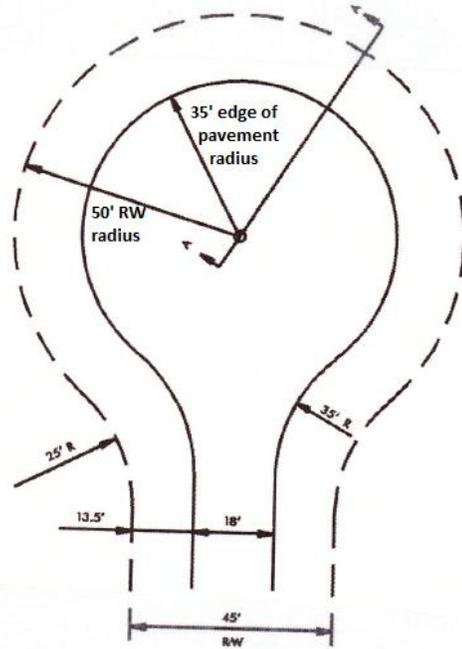
	<b>Total Length</b>	<b>Edge of Pavement Radius</b>	<b>Right of Way with curb and gutter</b>	<b>Right of Way without curb and gutter</b>
<b>Short Cul-de-sac</b>	500 ft. or less	35 ft.	45 ft.	50 ft.
<b>Long Cul-de-sac</b>	501 ft. to 1,000 ft.	40 ft.	50 ft.	55 ft.

*Figures 1 and 2* are visual representations of short and long cul-de-sac radii. Through researching cul-de-sac radii, it may be appropriate to also include a NCDOT hammerhead design or other alternative designs as an approved turn around to allow applicants an option to deviate from a traditional bulb design. This can be seen in *Figure 3*. Staff will include the graphics of these designs as part of a Unified Development Ordinance amendment to clarify for both Technical Review Committee and applicants alike.

Figure 1: Short Cul-de-sac

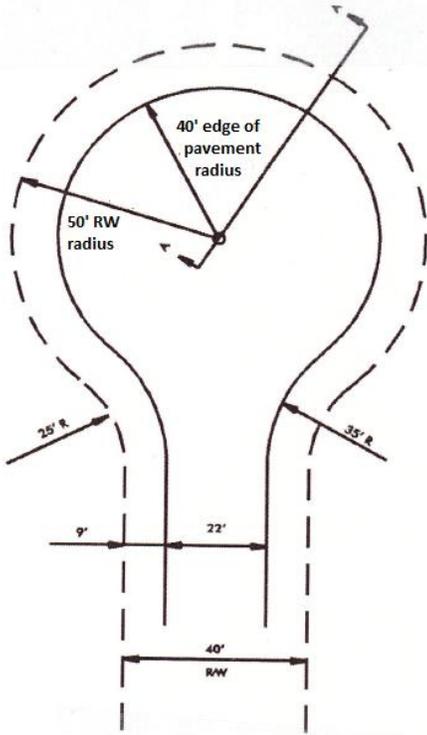


Symmetrical Cul-de-sac  
with curb and gutter

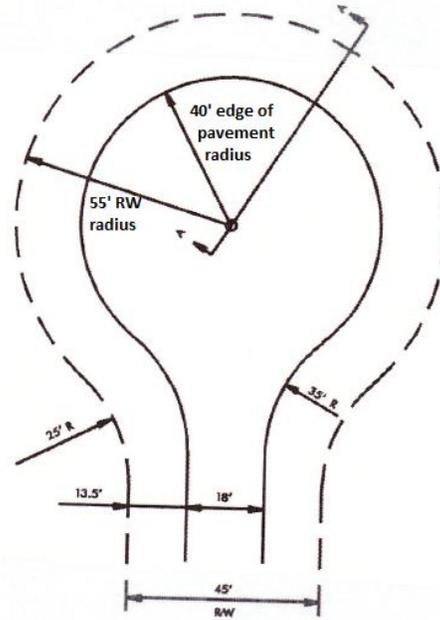


Symmetrical Cul-de-sac  
without curb and gutter

Figure 2: Long Cul-de-sac

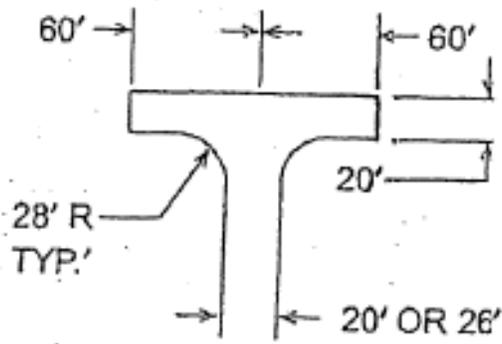


Symmetrical Cul-de-sac  
with curb and gutter



Symmetrical Cul-de-sac  
without curb and gutter

Figure 3: Alternative Design



120' Hammerhead