

Guidelines for Noise Attenuation Along Arterial Roads



Clarington

Planning Services Department
Corporation of the Municipality of Clarington

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1. Introduction

The Municipality of Clarington is committed to address the need for noise attenuation for new homes while minimizing the use of noise attenuation fencing. Consequently the following Guidelines provide alternative methods of achieving noise attenuation along arterial roads. In the case where fencing is the only option for achieving noise attenuation along an arterial road, these guidelines are also intended to minimize the adverse aesthetic impacts normally created by noise attenuation fencing (i.e. lack of walkability within and between neighbourhoods, monotonous design, long term maintenance etc.). The following images illustrate the potential affects that noise attenuation may have on a community:

1.1 Monotonous Design

Noise attenuation fences along arterial roads have the potential to be very monotonous in design, and are in most cases difficult to maintain. Together, monotonous design and lack of long-term maintenance provide for an unaesthetic streetscape.



1.2 Lack of Walkability

Noise attenuation fencing along an arterial road can limit the amount of walkability within and between neighbourhoods. Traditional reverse-lotting onto an arterial road would require a direct access to the road. In some cases, residents will provide

their own personal access from their rear yards through to the arterial road by constructing a gate, in contravention to Ministry of Environment and Climate Change (MOECC) requirements.



2. Purpose

The primary purpose of these Guidelines is to achieve more aesthetically pleasing and attractive streetscapes. If the use of fencing is the only option for noise attenuation along an arterial road, these guidelines are meant to ensure that the fencing enhances, and is complementary to the surrounding environment.

Noise attenuation is generally required to achieve noise levels on private property in conformity with MOECC standards. Arterial roads form the edges and boundaries of communities and consequently play a significant role in establishing the image and identity of the community within.

3. Use of Noise Attenuation Fences

The MOECC requires that outdoor amenity areas of sensitive land uses such as residential development are to be protected against elevated sound levels from adjacent arterial road traffic in excess of 55 dBA. In order to ensure that sound levels in outdoor amenity areas are acceptable to the Ministry, the Region of Durham and the Municipality of Clarington, noise mitigation measures are incorporated into new residential

developments adjacent to arterial roads.

Mitigation measures can be in the form of physical structures such as walls, fences and berms, or combination thereof. Noise levels in compliance with MOECC standards on private property can also be achieved through alternative measures such as site planning, architectural design and building construction. Figure 1 illustrates a lot fabric for which noise attenuation fencing would be required.

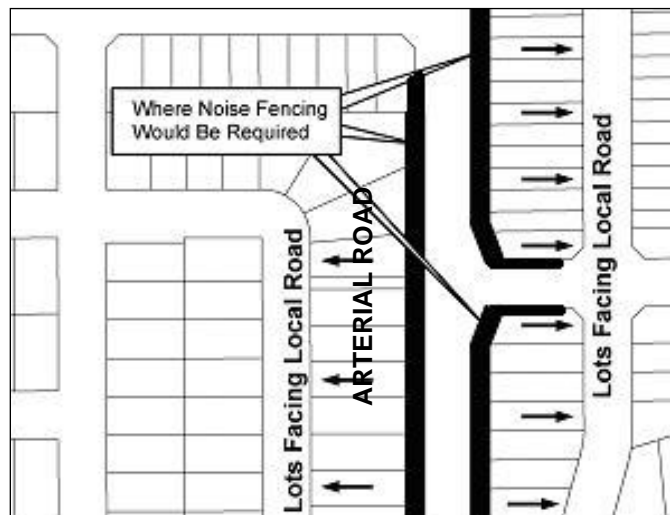


Figure 1: Traditional Reverse-lotting

The Municipality of Clarington generally discourages the use of noise attenuation fencing in favour of design solutions. In such cases where alternatives are not a viable option, these Guidelines will suggest methods of building on and enhancing the Municipality's Engineering Services Department's minimum functional standard for noise attenuation fencing.

4. Design Considerations

In many development cases, the urban fabric can be designed in such a way as to minimize or eliminate the use of noise attenuation fencing. The more commonly used alternatives to

noise fencing that the Municipality encourages are:

- Direct frontage lots
- Rear lands
- Window streets
- Less sensitive land uses

The following is a brief description of them.

4.1 Direct Frontage Lots

Lots can be zoned to specify that the front yard face the arterial road resulting in the house itself being the noise barrier between the traffic and the outdoor amenity space in the defined rear yard. Alternative driveway arrangements could include shared driveways, or rear garage access from the local road abutting the rear lot line.

Lots Facing Arterial Road

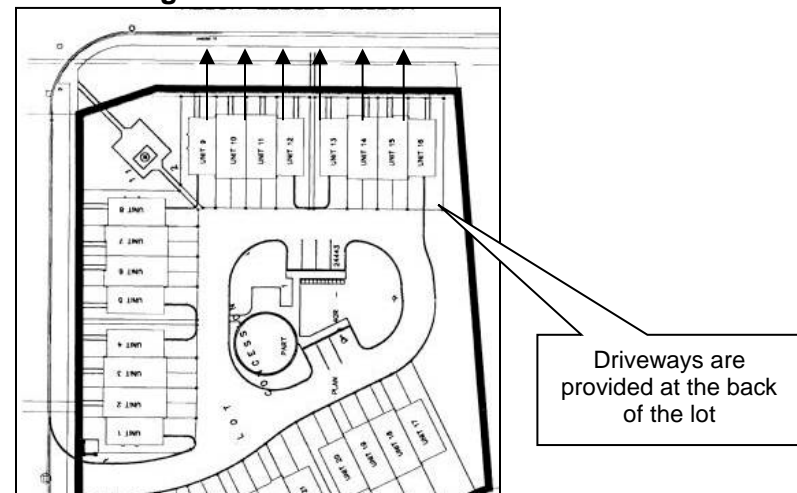


Figure 2: Direct Frontage Lots

4.2 Rear Lanes

Rear lanes in residential areas abutting arterial roads would allow the dwellings to front onto the arterial road, eliminating the need for noise attenuation fencing and creating a strong built presence along the street. This would also alleviate access problems along high volume traffic throughways because vehicular access to the lot would be from the rear lane.

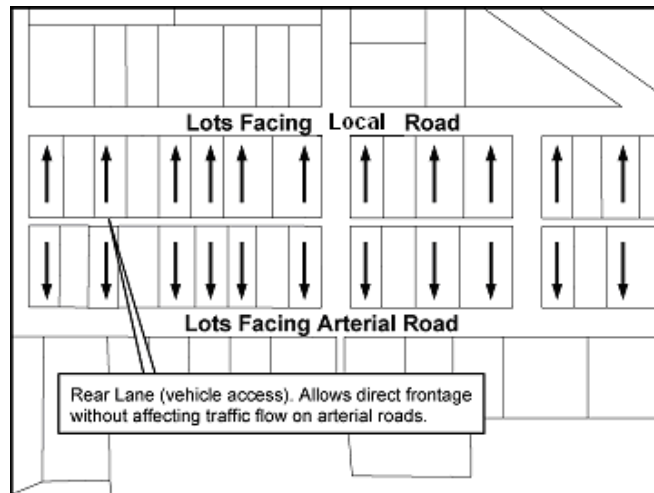


Figure 3: Rear Lane Arrangement

4.3 Window Street

“Window Streets” are single-loaded roads adjacent to arterial roads to provide access to individual homes and a visual “window” into the neighbourhood. Designing the local road system to allow for window street or side yards abutting the arterial road creates opportunities to reduce the visual presence of noise attenuation fencing and better define the spaces along the arterial roads. Subdivision design and development should incorporate staggered service road patterns generally limited to one block.

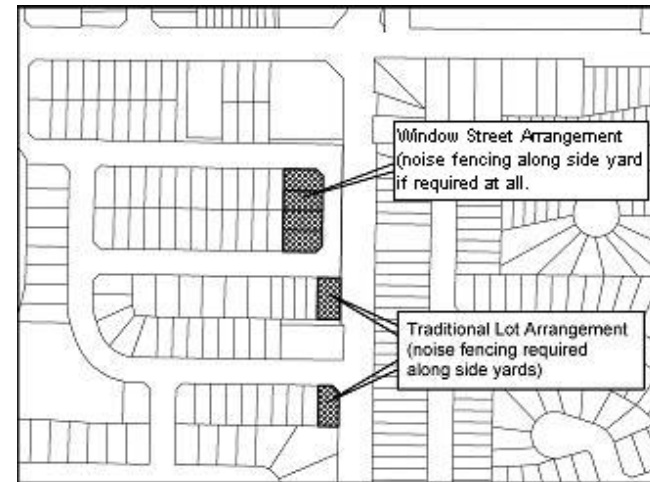


Figure 4: Window Street Arrangement

4.4 Less Sensitive Land uses

Locating less sensitive land uses such as commercial, institutional and open spaces along arterial roads will help to create a productive and attractive streetscape and act as a noise barrier for residential areas behind.

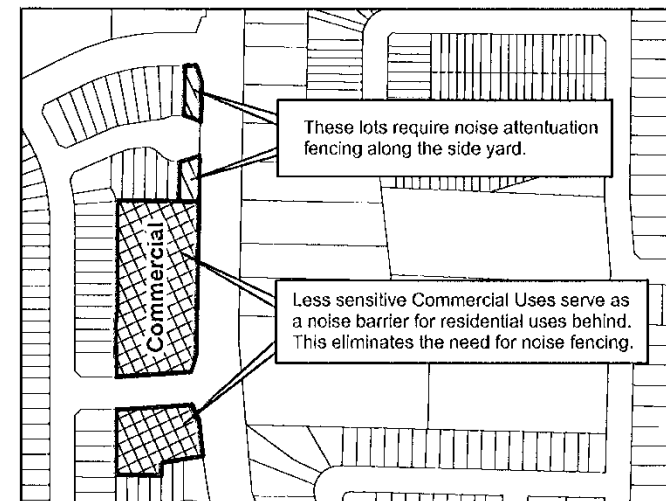


Figure 5: Non-Sensitive Use Buffer

5. Noise Attenuation Fence Guidelines

Once the design alternatives to noise attenuation fencing, as described in Section 4 have been applied to the development of a parcel the following will govern the design of noise attenuation fencing along arterial roads for those areas that require noise attenuation.

5.1 Vision

To achieve an aesthetically pleasing and pedestrian friendly streetscape by ensuring that the noise attenuation fencing required adjacent to arterial roads protects residential neighbourhoods from excessive noise and is of the highest reasonable design standard.

5.2 Objectives

- 5.2.1 To enhance awareness of the impact of noise attenuation fencing as a significant design element for communities at an early stage of the development process.
- 5.2.2 To encourage the use of design alternatives to noise attenuation fences and only use fencing as a last resort to meet noise attenuation requirements along an arterial road.

5.3 Policies

Noise attenuation fencing is the last resort to address noise generated from roads.

When noise attenuation fencing is the only option, the developer/applicant will be required at the draft plan of subdivision application or site plan approval application stage, to identify and justify to the satisfaction of staff in a planning report, the circumstances that make it unreasonable to implement an alternative noise mitigation measure such as those discussed above, in the development. The justification may include the following:

- a. A demonstration of how site constraints place limitations on site design which result in an unreasonable and disproportionate discrepancy in lot or unit yield between a development screened by noise attenuation fencing and a development that is not; and
 - b. A comparative examination of the private and public costs of the alternative noise attenuation measures to the costs of erecting, maintaining and replacing noise attenuation fencing.
- 5.3.1 In such cases where Council supports the use of noise attenuation fencing, the developer/applicant will be required to:
- a. Demonstrate how landscaping in association with a berm and/or noise attenuation fence will create an aesthetically pleasing and pedestrian friendly streetscape while representing the character of the adjacent community and the urban design theme of the development;
 - b. Indicate the cost of long term maintenance of the proposed noise attenuation fencing or structure versus the cost of an alternative design of noise attenuation; and
 - c. Include details for the design, financing, timing of implementation, construction and landscaping of berms and/or noise attenuation fencing within the subdivision, site plan or condominium agreement for the proposed development, with the Municipality of Clarington and the Region of Durham.
- 5.3.2 Detailed design upgrades and decorative columns for noise attenuation fencing should be designed based upon the Municipality's standard noise attenuation fence details as a minimum standard. The design of the noise attenuation fence should be representative of the character of the adjacent neighbourhood.

5.3.3 Noise attenuation fences should provide for a consistent edge and as part of an overall “community theme” concept is should assist in creating a special identity of the community within. Landscaping alternatives to enhance necessary noise attenuation fencing must be low maintenance and may include but is not limited to:

- a. Multiple rows of trees
- b. Tree groupings and/or plantings
- c. Berming in conjunction with noise fencing

5.3.4 Landscaped features associated with noise attenuation fencing should include a combination of soft and hard landscape features such as berming or vegetation, to create an appealing edge to the community.

5.3.5 Noise attenuation fencing should incorporate a complimentary palette of colours, materials, forms and motifs used throughout the adjacent development.

5.3.6 Noise attenuation fencing should be located on the private property no further than 0.3 metres from any lot line.

5.4 Noise Attenuation Fence Criteria

5.4.1 Noise attenuation fencing shall generally be no less than 1.2 metres and no greater than 2.14 metres in height above finished ground elevation abutting residential areas.

5.4.2 The geometry of the noise attenuation fence shall be varied to avoid creating a monotonous streetscape.

5.4.3 When noise attenuation fencing is required, the fence shall be located on private property only. Where a fence is articulated to avoid a monotonous streetscape, land dedication may be required to provide adequate space to accommodate such articulated fencing.

5.4.4 Noise attenuation fencing shall be compatible in terms

of colours, textures and patterns with the architectural style of the adjacent neighbourhood.

5.4.5 Decorative columns and posts will be evenly spaced and coincide with the panels and changes in horizontal alignment of the noise fence.

5.4.6 All materials used in the construction of noise attenuation fencing will be durable with a predicted maintenance free life span of thirty (30) years or greater.

5.4.7 The Municipal side of the noise attenuation fence is to be landscaped with a combination of coniferous and deciduous trees and shrubs that are salt tolerant, drought tolerant, low maintenance and native to the area.

5.4.8 The ideal width for the landscaped buffer associated with noise attenuation fencing shall be 3.0 metres.

5.4.9 Noise attenuation fencing may be used in conjunction with landscaped berms to a combined maximum height of 4.5 metres subject to the above requirements.

5.5 Criteria for Landscaped Noise Berms

5.5.1 Landscaped noise berms shall be no greater than 3.0 metres in height.

5.5.2 The maximum slope gradient shall be 3:1, meaning 3 metres of base to 1 metre of height.

5.5.3 Landscaping and/or the noise attenuation feature shall be articulated or varied every two to three metres to avoid monotony in its appearance.

5.5.4 All noise berm materials must be low maintenance.

5.5.5 The Municipal side of the noise berm is to be landscaped with a combination of clustered coniferous and deciduous trees and shrubs that are salt tolerant, drought tolerant, low maintenance and native to the area.

- 5.5.6 The landscaping area along the noise berm must be low maintenance and shall provide the following:
 - a. Clusters of plantings spaced at intervals appropriate for the length of the fencing
 - b. Plant material spacing and staggering shall be appropriate to the species and the scale and nature of the noise attenuation feature.
- 5.5.7 Plant material should be located at the base of the slope in order to take advantage of gravitational runoff and avoid drying out of plant material.
- 5.5.8 The side slope of a berm in the vicinity of large trees is to be terraced to trap water for water conservation purposes.
- 5.5.9 Naturalization of the noise berms side slope with tall grasses, wildflowers etc. is encouraged to create an herbaceous layer.
- 5.5.10 All plantings shall be in accordance with the planting policies contained in the Municipality of Clarington's Landscape Design Guidelines for Site Planning and shall be approved by the Municipality of Clarington.
- 5.5.11 Landscaped noise berms may be used in conjunction with decorative noise attenuation fencing.

6. Examples of Acceptable Designs

6.1 Variation in Materials



Variation in materials helps to combat the canyon-like effect of noise attenuation fencing on arterial roads. Texture variation creates visual interest and breaks up the monotony of a lengthy noise attenuation fence. This effect is illustrated in the pictures on the following page.

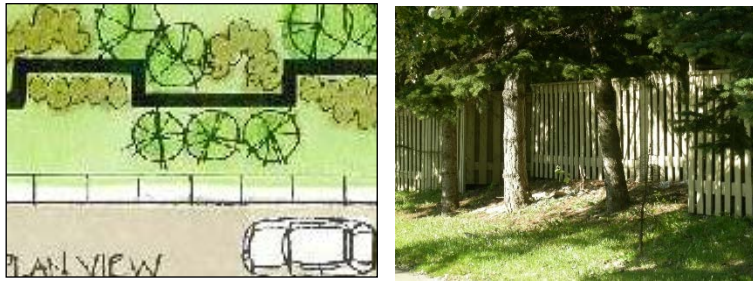
6.2 Variation in Design

The addition of elements such as decorative columns will help to create a visual balance against the strong horizontal line characteristic of noise attenuation fencing.



6.3 Horizontal Articulation of Fence

An effective method for reducing the visual impact of noise attenuation fencing is by articulating or jogging the line of the wall created by the noise attenuation fence. This will help to reduce the perceived height of the fence as well as break up the monotony of a lengthy noise attenuation fence. It will also create pockets which may be used for planting. Ultimately, the articulation helps to increase the free standing strength of the noise attenuation structure.



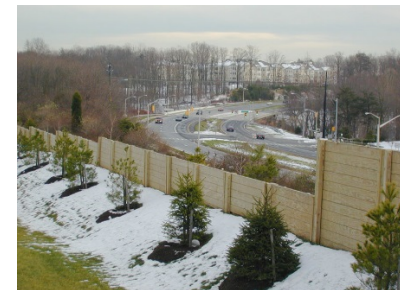
6.4 Complementary Landscaping

Plantings can be an effective means of emphasizing vertical lines in a noise barrier which creates a more balanced visual appearance.



6.5 Berming

Berms can be used in conjunction with noise fencing to reduce the apparent height of the wall. The straight line of the fencing may also be lessened by varying the height of the berm in relation to the constant height of the fence. The noise attenuation fencing should always terminate with a berm that is approaching the same height as the fence in order to blend into the surrounding landscape.



6.6 The Living Barrier

Living barriers are increasingly recognized as an aesthetically pleasing and environmentally-friendly alternative to conventional noise attenuation fencing. They integrate seamlessly into the natural environment and provide effective sound absorption by complying with MOECC requirements. Living barriers also provide several ecological benefits such as absorbing CO₂, filtering pollutants, alleviating storm water runoff and stabilizing surrounding soil.



7. Warning Clauses

The Municipality of Clarington's standard subdivision, site plan and condominium agreements shall include clauses relating to the following:

- a) The homeowner's acknowledgement of current and future noise levels in excess of what is recommended by the Ministry of Environment (55dBA) in the vicinity of their property;
- b) The responsibility of the homeowner to maintain and/or replace from time to time at their own expense, all fencing/noise attenuation walls necessary to maintain them in their original condition. Any repairs and/or replacements shall be made to the same standard and using the same materials and colours as the original fence or acoustic wall;
- c) The responsibility of the developer to maintain/replace any and all required landscaping, within the first three years of completion to ensure that landscaping is established and in fact low maintenance; and
- d) Living barriers do not comply with the Pool Enclosure By-law and therefore, when they are used as noise attenuation along an arterial road, it is the homeowner's responsibility to satisfy the requirements for a pool enclosure within the Pool Enclosure By-law.

8. Other Issues

8.1 Conformity with Fence By-Law

The design of approved arterial road noise attenuation fencing shall satisfy the requirements of the MOECC, and conform to this document, to the standards of the Region of Durham, where applicable, and to the Municipality of Clarington Engineering standards including the Fence By-law 2000-105, as amended, and the Pool Enclosure By-law.

Necessary land requirements should be determined through the development application process prior to draft approval and/or site plan approval. This will help to ensure that there is sufficient space to accommodate noise mitigation features while maintaining site triangles that are clear of vegetation.

8.2 Application of Guidelines

The Noise attenuation guidelines along arterial roads applies to all development adjacent to arterial roads within the Municipality of Clarington where noise attenuation is required to be included with the approval of development. At the discretion of the Director of Planning Services, these guidelines can be modified depending on the nature and scale of the proposed development, provided the intent of the guidelines can be maintained.

All guidelines or any modification thereto will be implemented through the site plan, consent or the plan of subdivision review process and be incorporated into the development agreement wherever possible.

8.3 Periodic Review

These guidelines will be reviewed and updated periodically.