

REGION OF OTTAWA-CARLETON
RÉGION D'OTTAWA-CARLETON

REPORT
RAPPORT

Our File/N/Réf. Your File/V/Réf.	42-98-0008
DATE	29 May 2000
TO/DEST.	Coordinator Transportation Committee
FROM/EXP.	Planning and Development Approvals Department Commissioner
SUBJECT/OBJET	PROPOSED NOISE BARRIER DESIGN STANDARD

DEPARTMENTAL RECOMMENDATIONS

That the Transportation Committee recommend Council:

- 1. Adopt the "Proposed Noise Barrier Design Standard" attached at Annex "A" (dated May 2000);**
- 2. Adopt the provisional list of products and suppliers/manufacturers listed in Annex "B" to be acceptable for installation in RMOC;**
- 3. Allow staff to amend Annex "B" subject to the presentation of appropriate evidence from new suppliers/manufacturers that their product complies with the proposed noise barrier design standard at Annex "A".**

BACKGROUND

At their meeting on the 2 February 2000 following input from Mr. N. Heins, Prestige Fence, (one of the suppliers referred to in the staff report), Transportation Committee adopted the Proposed Noise Barrier Design Standard with the following changes.

- 1: Approve that reference to Ontario Building Code (OBC) standards be removed from the RMOC's Design Standard for Noise Barriers;*

- 2: *Approve that soft-landscaping that could include trees and vines be mandatory for all noise barriers.*

As a result of subsequent input from other noise barrier suppliers, Mr. Parisien, Alcuf International and Mr. R. Lee, Executive Director, Ottawa-Carleton Home Builders Association, Regional Council, at their meeting on 9 February 2000 referred the proposed standard back to staff for further consultation with all the interested parties.

Copies of correspondence from Harmer Podolak, Engineering Consultants Inc., on behalf of Mr. Heins, and from Mr. Lee are attached at Annex "C".

STAFF ACTION

In response to Council's direction, all the noise barrier suppliers/manufacturers listed in Annex "B" of the staff report, along with the Ottawa-Carleton Home Builders' Association were forwarded a copy of the Draft Standard and requested to provide comments by mid-March. As only 3 responses were received by the original deadline (Alcuf International, Homeland Vinyl Fencing Ltd. and Harmer Podolak (Prestige Fence)) the deadline was extended to the end of March.

Responding to the deadline extension comments were received from Prestige Fence, Richard Dray Engineering Inc. on behalf of International Fence, Durisol Inc., the Ottawa-Carleton Home Builders Association and the South March (Kanata) Community Association, and the Kanata Council of Community Associations. The responses received are to be found in Annex "C".

SUMMARY OF MAJOR ISSUES RAISED IN INPUT RECEIVED

a) Alcuf International

- Favours designing to Ontario Building Code (OBC) and not Ontario Highway Bridge Design Code (OHBDC).
- In most cases designing to OHBDC is overkill.
- Cost difference attributable to design standard is 20-25%.
- Suggest leaving the design decision to the expertise of the geotechnical consultant (post footings).
- Alcuf's warranty is 20 years on the frame and aluminum panel in-fill. Aluminum panel has an STC rating of 20.
- Aluminum in-fill and other composites are as cost effective as timber.

b) Homeland Vinyl Fencing Ltd.

- Agrees with the proposed standard.
- Wants serious consultation of all suppliers/manufacturers regardless of their plant location.

- Their product does not have wooden posts but is comprised of galvanized steel posts and panels finished with extruded vinyl (PVC) covers.
- a) Harmer Podolak Engineering Consultants Inc.
- Supports designing to OHBDC.
 - The OBC has no provision for the design of noise barriers.
 - Only the OHBDC provides specifically for the design of noise barrier.
 - Should OHBDC Code requirements be over-ruled for barriers under 3m, well constructed barriers would gradually disappear from the market since they could not compete with systems not designed to that code.
 - Suggests that the standard should clarify whether soils to a depth of 1.5/1.8m (depending on snow cover) should/should not be used to provide horizontal resistance.
- b) Ottawa-Carleton Home Builders' Association
- OBC standard is adequate for fences up to 3m high.
 - Leave final determination of design standard to geotechnical consultant.
 - Price difference between design to OBC instead of OHBDC is closer to 20/25% less - not 10/15%.
 - OHBDC standard for all noise barriers is not cost effective.
- a) South March (Kanata) Community Association: (Requested by Mr. Heins, President, Prestige Fence)
- Moving away from the OHBDC will ultimately increase maintenance costs and allow barriers that will fail to stand up to wind and snow loading.
 - Failed noise barriers will cease to be effective for noise mitigation and will be unsightly.
 - Failed noise barriers will lean/collapse/be unsafe.
 - Homeowners are highly unlikely to repair failed noise barriers. Such a responsibility on homeowners is unreasonable.
 - ROC should expect at least a 20 year life for noise barriers; thus ensuring that taxpayers receive the highest quality product.
- a) International Fence: (Comments from Richard Dray Engineering Inc.)
- There is a variety of products with a 20 year warranty, including International Fence.
 - In view of the cost of noise barriers and the inevitable increase in future costs the selection of a fence should be based on both longevity and cost-effectiveness with the balance tilted towards longevity.
 - Foundations are the most important and most problematic part of the construction.
 - Wooden posts will rot.

- There are several pre-cast panel systems on the market that do not conform to CSA standards with respect to the placement of reinforcement and concrete quality. These products should not be considered.
- There is only a monopoly currently in the field of sound absorbing fence panels.

b) Prestige Fence

- There are 4-5 suppliers/manufacturers in the RMOC who have installed products satisfying the past guidelines which required design to OHBDC guidelines for all barrier heights.
- Design to OBC only will result in barriers like those on Hunt Club Road which have had to be upgraded since their installation 7+ years ago.
- Barriers designed to the OHBDC will be of higher quality, last longer and have lower maintenance costs.
- Most homeowners neither want to or are able to carry out repairs especially replacing a footing or post.
- Although a 20 year warranty on the complete product would be difficult, the expectation of a 20 year lifespan with minimum maintenance should be expected by ROC.
- Aesthetics should be considered. The sound barriers built in Toronto to lower standards have heaved and are in various stages of disrepair, while many are less than 10 years old.
- Over the past 5/6 years since the earlier standard was introduced wooden sound barriers have regained the trust of the market that was lost due to the earlier lower standard.

1) Durisol Inc.

- In supplying barrier systems to most major municipalities in Ontario, the trend is towards more stringent standards.
- Endorse the adoption of CSA Standards for wooden products.
- Wooden walls are more suitable as privacy screens, but, as noise barriers, have not stood the test of time very well.
- Absorptive noise wall systems require durability to be specified.

2) Kanata Council of Community Associations

- Lowering noise barrier standards will ultimately increase maintenance costs.
- Failed barriers are no barrier to traffic noise and are extremely unattractive, and unsafe.
- Placing the responsibility for maintenance on homeowners is unreasonable.
- A life expectancy of at least 20 years should be a minimum requirement.
- Those wishing to lower standards fail to see the advantage of structurally sound and attractive barriers.

CONCLUSIONS

Based on the comments received staff have modified the Proposed Noise Barrier Standard that was presented to Transportation Committee on 2 February 2000.

The amended version of the Proposed Noise Barrier Standard, with the changes highlighted, is attached at Annex "A".

The list of approved suppliers/manufacturers as amended to reflect input received is attached at Annex "B".

The principal amendments to the proposed noise barrier standard resulting from the input received are as follows.

- 1) Amplification of scope/objective of the proposed standard.
- 2) Acceptance of sound absorptive qualities.
- 3) Acceptance of composite and metal panels.
- 4) Design to comply with OBC or OHBDC, per Geotechnical Engineering advice.
- 5) Barrier System (material and construction) to be guaranteed for a minimum of 5 years.
- 6) Inspection after 3 years and all defects rectified by supplier.
- 7) Barrier life expectancy of at least 20 years.

REGIONAL OFFICIAL PLAN/TRANSPORTATION MASTER PLAN

The ROP contains policies to ensure that communities are not subjected to unacceptable levels of noise. An appropriate noise barrier design standard helps to achieve this objective.

FINANCIAL IMPLICATIONS

This report has no direct financial implications.

*Approved by
Nick Tunnacliffe, MCIP, RPP*

PROPOSED NOISE BARRIER

DESIGN

STANDARD

(REVISED: MAY 2000)

6.0 PROPOSED REVISION TO THE ROC STANDARD FOR NOISE BARRIERS

6.1 BASIC PRINCIPLES

The following summarize the basic principles adopted to revise the current ROC Standard For Noise Barriers document:

1. To focus on meeting the acoustic criteria.
2. Allow the use of competitive products and limit the possible monopoly that may develop.
3. Not restrict the industry from developing various acceptable design alternatives.
4. Encourage the use of friendly, **but durable** products that homeowners can relate to or maintain, where necessary.
5. Provide realistic warranties that focus on the barrier system and not only on the panels or material.
6. Relate the barrier standards to the current ROC Noise Control Guidelines.
7. Provide effective implementation procedures for barrier design and installation.

6.2 THE PROPOSED ROC NOISE BARRIER STANDARD

Preface

This Standard specifies requirements for design, material and construction of noise barriers.

This standard complements the following ROC Noise Control guidelines:

- Noise Control Guidelines For New Developments Adjacent to Existing and Proposed Regional Roads and Transitways.
- Noise Control Guidelines For New Construction, Reconstruction and Widening of Regional Roads and Transitways.
- **Noise Barrier Retrofit Policy for Residential Developments Adjacent to existing Regional Roads and Transitways.**

The use of this Standard is expected to result in a higher quality noise barrier system and lower capital and maintenance costs to both, the residents in the case of developer – constructed barriers, and to the Region in the case of retrofit or capital works projects.

This standard is subject to periodic review, and suggestions for improvement may be referred to the appropriate ROC Office.

All inquiries regarding this Standard, including requests for interpretation, should be addressed to:

Region of Ottawa Carleton
Environment and Transportation Department
111 Lisgar Street, 4th Floor
Ottawa Ontario,
K2P 2L7

Requests for interpretation should:

- (a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
- (b) provide an explanation of circumstances surrounding the actual field condition.

1. Scope/Objectives and Application

1.1 Scope/Objectives

This standard provides outline specifications for the design and installation of roadway and railway noise barriers constructed or approved by the Region of Ottawa-Carleton. The specific requirements described in this standard are not to be considered all inclusive. Any new design, material or installation technique not specifically addressed in this standard should be evaluated with the general fundamentals of acoustics, durability, safety, and functionality in mind.

This standard applies to noise barriers constructed by the ROC in connection with Regional Road capital works projects that may be subject to the EA process and to retrofit noise barriers **installed** by the ROC. The standard also applies to noise barriers approved by the ROC in connection with new development projects subject to the ROC approval process.

The objective of this Standard is to set Regional design and construction guidelines for the approval and installation of durable and high quality noise barrier systems, with a life expectancy of at least 20 years, that will result in lower capital and maintenance costs to both the developers and residents in the case of developer-constructed barriers and to the ROC in the case of noise barrier retrofit or capital works projects.

1.2 Application of the CSA Standard For Noise Barriers on Roadways to Projects in the ROC

Certification organizations, such as the Canadian Standards Association, as accredited by the Standards Council of Canada, have their own criteria and procedures for certification services. CSA provides certification services for manufacturers who, under license from CSA, wish to use the appropriate registered CSA marks on certain products of their manufacture to indicate conformity with CSA Standards.

It should be noted that the CSA Standard for Noise Barriers is neither binding on the manufacturers of noise barriers nor on the approval agencies. The CSA Standard was developed to promote standardization of the noise barrier industry across the country with a view to developing a safe, durable and effective product.

It is the intent of the Region, however, to accept noise barriers bearing the CSA mark as meeting the ROC Noise Barrier Standard in addition to other noise barrier systems that meet this ROC Standard.

The objectives of the ROC Standard will, therefore be as follows:

1. To endorse noise barrier systems utilizing materials bearing the CSA mark.
2. To also consider noise barrier systems not bearing the CSA mark which are manufactured to either meet the ROC Standard or have proven themselves to be worthy of consideration based on successful installations that “stood the test of time”.
3. To encourage more local manufacturers to develop a variety of quality and safe products that meet the ROC Standard, and ultimately the CSA Standard.
4. To provide the necessary flexibility in meeting site specific challenges or problems with the use of qualified and professional expertise in the areas of structural and geotechnical engineering and landscape architecture fields.
5. To provide integrated solutions to environmental noise issues and their controls in accordance with other ROC noise policies and guidelines.

2. Design

The details presented in this Standard refer to noise barriers as a total and integrated system of various components including the base berm, if any, the wall and all other associated components as defined herein.

All individual components to be designed to be capable of being assembled on site to conform to the drawings and specifications. The panels to be designed to facilitate ease of on-site replacement.

The design of the system shall be site-specific and in accordance with the Ontario Building Code (OBC) or the Ontario Highway Bridge Design Code (OHBDC), prepared by qualified professional engineers and acoustic consultants. Input may be required from qualified geotechnical/structural engineers.

2.1 Acoustics

2.1.1 Material Density/Sound Transmission Class (STC) Requirements

For a panel to be qualified as a sound barrier material, one or more of the following conditions should be met:

- The surface density of the panel material to be not less than 20 kg/sq.m.
- The Sound Transmission Class (STC) of the panel material to be 20 or greater when tested in accordance with ASTM-E90 (a test report to be submitted for approval).
- The Sound Transmission Class (STC) of the panel material has historically been demonstrated to be 30 or greater.

In addition, sufficient measures are to be taken to prevent drumming of the panels caused by wind or ground vibration.

2.1.2 Noise Reduction Coefficient (NRC)

If the noise barrier system is specified by the Acoustical Consultant to be sound absorptive, the barrier panels should be tested to determine the Noise Reduction Coefficient (NRC) in accordance with ASTM-C423. A panel or an assembly of panels should be tested as required in accordance with the ASTM Procedures for free-standing screens.

The use of alternate methods of providing the necessary sound absorptive qualities by a barrier system should be subject to special approval by ROC based on qualified technical data to be submitted by the proponent. This may include the use of double walled noise barrier panels (sandwich construction with perforated facing) or the use of substantial landscaping designs along the barrier faces by a Landscape Architect.

2.2 Expansion Joints

When a noise barrier alignment traverses structure expansion joints, the noise barrier is to be designed and installed so as to accommodate movement of the noise barrier panel without placing undue stress on the structure and the noise barrier installation, or reducing acoustical attenuation. The joints in the noise barrier are to match the size and location of the structure joints.

2.3 Height

The noise barrier system design should provide details of methods and materials to be used to accommodate varying wall heights above the top of footing.

2.4 Panel Orientation

Noise barrier elements should be designed and oriented to minimize entrapment and ponding of water, and accumulation and infiltration of dirt and debris inside and on any surface of any component. Corrugated or ribbed panels should be mounted such that the features are oriented vertically.

2.5 Panels with Fire Hose Access

Noise barrier panels with fire hose access openings, if required, shall be designed with additional reinforcement and protective coating around the opening as necessary to maintain structural integrity.

3. Materials

3.1 General

For materials not specifically included in this section, the manufacturer should demonstrate to the Region that the material has a minimum predicted maintenance free lifespan of 20 years.

All materials should have a flame spread classification less than or equal to 140 and smoke developed classification less than or equal to 180 when tested in accordance with the ULC standards.

Metal and non-metallic components of noise barrier systems including their performance, such as corrosion and weathering, to be in accordance with the applicable CSA, ASTM, CAN/ULC, ULC, CSA/CAN and ANSI standards, where available.

3.2 Coatings

Coatings refer to all paints, stains and laminates. All coated components to be rated for accelerated weathering. All coated steel components to be resistant to corrosion.

Components which are hot dip galvanized or coated with a polyvinyl chloride (PVC) plastisol using an epoxy primer using no adhesives for bonding, need not have accelerated weathering test data

3.3 Concrete Panels and Posts

3.3.1 Cast-in-Place

Cast-in-place concrete to conform to the requirements of the CSA Standards.

3.3.2 Precast

Precast concrete to conform to the requirements of the CSA Standards.

3.3.3 Steel Reinforcing

All steel reinforcing to conform to the requirements of the CSA Standards. The bars to be free from rust, scale or other substances that will prevent bonding.

All reinforcing bars should be epoxy coated conforming to ASTM Standards.

The concrete cover over the steel reinforcing should meet the requirements of the CSA Standards.

3.4 Bare Metal Components

All bare metal components to be either fabricated of nonferrous materials or hot dip galvanized after fabrication according to the requirements of CSA Standards. All welding to conform to CSA Standards.

3.5 Composites and Metal Panels

Steel panels exposed to traffic and snow removal operations to be minimum nominal 0.91 mm galvanized steel (20 gauge). All other panels to be of minimum nominal 0.76 mm galvanized steel (22 gauge). All steel sheeting components to be coated with a material meeting the requirements of this standard.

Acceptable products include galvanized panels and then coated with an organic polyvinyl chloride (PVC) plastisol using an epoxy primer using no adhesives for bonding. The coating system thickness must be 200 µm on the surfaces exposed to traffic and snow removal operations and 100 µm thick on all other panel surfaces.

Pop-rivets shall be either aluminum with an aluminum mandrel or aluminum with a stainless steel mandrel.

Other composites or metal panels, such as aluminum, may be used as panels for sound barriers, provided that such products are corrosion resistant and meet the acoustic and other performance criteria in this Standard.

3.6 Sound Absorptive Quality

If the noise barrier system is specified by the Acoustical Consultant to be sound absorptive, the average Noise Reduction Coefficient (NRC) shall be not less than 0.70 (70%). Sound absorptive materials used to fill cavities in double walled noise barrier systems to increase sound absorption shall be semi-rigid type.

3.7 Wood Components

All wood products to be either naturally resistant to decay for a minimum of 20 years or to be pressure treated. The panel must be composed of tightly fitted wood boards so as to avoid warping, splitting and loosening of particles, knots and imperfections. All boards must be tightly butted and secured.

The use of board-on-board panels to meet the stated density/acoustic criteria is acceptable provided that the boards are thoroughly-secured. In addition, board-on-board panels shall have tightly butted joints that are staggered with provision to allow for expansion/contraction and for making the necessary field adjustments (e.g. for tightening up of developed gaps), where required .

The use of Tongue and Groove, and V-joints for joining panels is acceptable provided that the tongue or V-joint extent is not less than 19mm (3/4") long.

Nails and other fastening devices must be either hot dip galvanized steel, or made of nonferrous or stainless steel.

When there is ground contact with wood, the wood must be pressure treated and cut ends to be also treated or protected from moisture penetration.

For wooden noise barriers, the following are the minimum acceptable features to qualify as an acceptable noise barrier system:

- a. All wood shall be selected for good appearance and free of defects and large/heavy knots. In addition, all torn grain and surface stains shall be eliminated by appropriate surface refinishing.
- b. All skirts coming in contact with the ground/soil shall be pressure treated with finished cut edges **treated or protected from moisture penetration** and to be buried 100 to 150mm below the finished ground level.
- c. All exposed panels to be dressed with bevelled edges on both sides.
- d. All wooden posts (metal posts are also acceptable) to have minimum dimensions of 140 x 140mm or larger as required by the governing code, dressed to pattern.
- e. Double posts are required on all directional changes greater than 20°.
- f. Install coping on top of panels using one piece wood (or other acceptable metal products)
- g. The use of decorative elements such as pilasters, curved (scalloped) top rail, post caps, wood designs, etc. is preferable. In all cases, the decorative elements should not affect the minimum barrier height requirements, the density or any other acoustic/structural requirements.
- h. Wood and/or metal frames to be used to support the wood panels in place and to be designed to allow expansion/contraction of the wood panels/elements and for making the necessary field adjustments, where required.
- i. All metal components, if any, used in a wooden sound barrier to conform to the metal or steel component specifications in this Standard.

3.8 Brick

All bricks used to be in accordance with the CSA standards.

4. Installation

All work and noise barrier materials for specific installations are subject to field certification by the design professionals to ensure adherence to the requirements in this specification.

The noise barrier should be installed to meet the reference wind pressure as described by the Authority for the specific location of each installation.

All materials delivered to the construction site should be visually inspected by the owner and/or their representatives for proper dimensions, cracks, voids, surface defects, inconsistency in colour and texture, and any other damage or imperfections.

4.1 Height and Alignment

The noise barrier to be constructed to the height and alignment as specified by the Acoustical Consultant. The minimum specified height of the noise barrier to be maintained at all times.

4.2 Footings and Posts

The foundation, footing and post design shall meet the objective of constructing a durable sound barrier that meets or exceeds the objectives of this Standard and the set minimum guarantee of 5 years for material and installation of the noise barrier system.

4.3 Site Grading and Preparation

Earth grading associated with the barrier installation shall be completed to within 25mm of the proposed elevation of the bottom of the barrier. Grading shall be completed and approved prior to construction of the barrier footings.

To prevent openings from occurring under the barrier an additional timber not less than 5mm x 20mm in section shall be securely fastened horizontally to the bottom of the barrier and shall extend the full width of each barrier panel between adjacent vertical posts. This additional timber shall be buried to a depth equal to one-half its width during the final grading operation. Earth and pavement grading shall be sloped at a minimum of 2% and a maximum of 50% away from the barrier.

All graded earth to be compacted to at least 95% Proctor density.

Changes in alignment to occur at the posts by suitable means to avoid acoustical degradation.

5. Masonry Walls

Masonry walls to be installed in accordance with the requirements of AASHTO Guide Specifications for Structural Design of Sound Barriers.

Bricks to be installed on a suitable foundation not less than 500 mm above the final groundline.

The top row of all masonry walls and posts to be protected with coping and/or flashing.

Mortar used to set the bricks, shall be in accordance with the CSA Standards.

6. Fire Hydrant Access

When the installation of a noise barrier interferes with the access to existing or proposed fire hydrants, the noise barrier installation should include fire hose access openings and associated identification signs. Location and demand for these openings to be established in cooperation with the local fire departments.

7. Overhead High Voltage Lines

Where the potential of arcing exists due to the close proximity of existing overhead high voltage lines. each metal panel and girt must be grounded in accordance with CSA Standards.

8. Other Considerations

8.1 Aesthetics

The design of noise barriers should also have regards to the following:

1. The applicable urban design guidelines and landscaping requirements.
2. Drainage, grading, landscaping design and aesthetic principles.

8.2 Landscaping

Soft landscaping, that could include trees and vines, to be included in all barrier projects.

9. Resonance (Drumming Effect)

To avoid excessive resonance by certain noise barrier wall materials, such as metal panels, the barrier system to be designed to reduce this phenomenon by acceptable means such as with the use of additional stiffeners, the application of noise damping compounds, sandwich construction, etc.

10. Approval By The Region

10.1 Noise Barrier System

In order for the noise barrier system design and material to be considered for approval, for installation at a specific site, the submission should provide the following:

- (a) The trade name of the product, if applicable.
- (b) The manufacturer's name and address.
- (c) Certification by a Geotechnical Engineer (calculations may be requested).
- (d) Certification by a Structural Engineer (calculations may be requested).
- (e) Detailed drawings of the entire noise barrier system and all its components.
- (f) A general statement as to the composition of the material.
- (g) Specifications regarding installation requirements as well as sequence of construction.
- (h) Noise Reduction Coefficient (NRC) report if the noise barrier is to be considered as sound absorptive; if required by the noise study.
- (i) Sound Transmission Class (STC) and/or the material surface density.
- (j) Detailed material specifications.

Any new design, material or installation technique for a noise barrier system will be evaluated for acceptability of use in the Region with a view to safety, durability, functionality and cost effectiveness.

The Design drawings and calculations shall be signed, sealed and dated by Professional Engineer(s) licensed in the area of expertise for which the approval is being sought.

10.2 List of Approved Suppliers

The ROC will establish a list of approved suppliers of noise barrier systems which will be periodically reviewed and updated by the Regional staff.

11. Installation

This section deals with the installation of noise barriers including design, submission, approval, construction and completion of the contracted work.

The following subsections briefly describe the minimum required data and specifications to be completed by the proponent in order to obtain approval from the Region:

11.1 Submittals

The following documents shall be submitted to the Municipality for approval for each noise barrier wall project:

- (i) Shop drawings, signed and sealed by a **qualified** Professional Engineer licensed by the Professional Engineers of Ontario, showing the details of noise barrier system components including material specifications.
- (ii) Structural drawing(s), signed and sealed by a **qualified** Professional Engineer licensed by the Professional Engineers of Ontario, showing foundation details and specifying design criteria, climatic design loads, as well as applicable geotechnical data used in the design.
- (iii) Layout plan and wall elevations showing proposed colours and patterns.
- (iv) A covering letter stating deviations or exceptions to the Regional Standard and the reasons/justification for the deviations.

11.2 Site Preparation and Grading

To be completed by the proponent.

11.3 Foundations

To be completed by the proponent.

11.4 Delivery, Handling, Storage and Protection

To be completed by the proponent.

11.5 Erection / Installation of Noise Barrier

To be completed by the proponent.

11.6 Clean Up

To be completed by the proponent.

11.7 Testing, Inspection and Quality Assurance

To be completed by the proponent.

11.8 Guarantee and Maintenance Period

- The noise barrier system (material and installation) to be guaranteed for a minimum period of five (5) years from the date of the initial Certification and Performance Acceptance.
- After 3 years from Certification, an inspection is to be carried out by the proponent or the Project Engineer with a report to be submitted to the Region. Any components which exhibit defects that are likely to affect the longevity of the barrier shall be replaced and/or repaired.

11.9 Initial Certification and Performance Acceptance

An Initial Certification by the proponent or the Project Engineer to be prepared and submitted to the Region following completion of the project.

12. Definitions

The following definitions apply in this Standard:

Sound Transmission Class (STC) - is a single-number rating of the capacity of a structure to prevent sound from reaching a receiving location. It is calculated in accordance with ASTM Classification E413 using values of sound-transmission loss measured in accordance with ASTM Test Method E90. It provides an estimate of the performance of a partition in dealing with certain common sound insulation problems.

Noise Reduction Coefficient (NRC)- is a single-number rating of the sound-absorptive property of a material. It is calculated as the average of the sound-absorption coefficients, measured in accordance with ASTM Test Method C423, at 250, 500, 1000 and 2000 Hz, and rounded to the nearest multiple of 0.05.

Panel- the panel component of a noise barrier is that portion which, when joined together, produces a solid wall. In most cases, the panels span the distance between supports.

Posts- are usually considered as vertical supports for the noise barrier panels.

Noise Barrier/Noise Barrier System- A Noise Barrier as referred to in this Standard refers to the noise barrier as **system** which includes the panels, posts, foundation, methods of design and construction details, finish and all other components as approved by the Region for inclusion in the ROC's List of Approved Suppliers.

Supplier- refers to the manufacturer of the noise barriers / noise barrier system and/or its representative responsible for making the necessary technical submissions to the Region as Well as well as the supply of the noise barrier system components.

Engineer or Consulting Engineer- shall mean the Professional Engineer or the Engineering firm licensed by the Professional Engineers of Ontario (PEO) which is engaged by the Supplier and/or project proponent to design and certify the noise barrier system. The Engineer shall have documented experience in the design, construction and review of Structural and/or Geotechnical Engineering Projects as required and in accordance with the Guidelines for Professional Engineering Services prepared by the Professional Engineers of Ontario.

Acoustical Consultant- is a Professional Engineer (P.Eng.), licensed by the Professional Engineers of Ontario (PEO) to practice in the Province of Ontario, with demonstrated experience in the field of acoustics and noise control as defined by the PEO Guidelines for Professional Engineers Providing Acoustical Engineering Geotechnical Services in Land-Use Planning.

Geotechnical Engineer- is a Professional Engineer (P. Eng.) licensed by the Professional Engineers of Ontario (PEO) to practice in the Province of Ontario, with demonstrated expertise in the field of geotechnical engineering as defined by the PEO Guidelines for Professional Engineers Providing Geotechnical Engineering Services.

**APPROVED NOISE BARRIER SYSTEMS CONFORMING TO STANDARD
(DATED MAY 2000)**

Company	Primary Noise Barrier Material/System, Finish,
Prestige Fence	Wooden frame system with wood infill panels (white pine). Horizontal rails are steel clad.
Central Precast	Precast concrete panels with reflective or absorptive finishes
Alcuf International	Aluminum frame system with a variety of wood, aluminum or composite infills.
International Fence	Precast concrete panels (Vertarib 2000) smooth finish or broom finish.
Durisol	Composite concrete/wood chip panels and steel frames
Homeland Vinyl Fencing Ltd	Galvanized steel posts and panels finished with extruded vinyl (PVC) covers.
Compact Industries	Primarily wood with wood or steel posts
Nex Products Inc.	Composite using waste recycled materials

PROPOSED NOISE BARRIER DESIGN STANDARD

COMMENTS RECEIVED



January 31, 2000

Mr. Nicholas Heinz
Prestige Fence
163 Cardevco Road
Carp, Ontario K0A 1L0

Dear Sir:

RE: STRUCTURAL REVIEW OF ROC NOISE BARRIER STANDARD

We have reviewed the Region of Ottawa Carleton Report No. 42-98-0008 dated December 21, 1999 and can offer the following comments.

In the last 20 years we have designed many noise barriers for clients such as the Ministry of Transportation, ROC, other Municipalities, Private Clients and also Manufacturers of noise barrier systems. Having been involved as designers, investigators, reviewers and members of manufacturer's teams, we have extensive experience with the common problems associated with the noise barriers.

Although we find the proposed standard very informative on the subject of material selection and acoustical expertise it is lacking the structural input. The seemingly innocent statement mentioned in article 4.2 ("The site-specific type, depth, size and shape of the foundations to be determined in accordance with the OBC (Ontario Building Code) for barrier wall height not exceeding 3 m and with OHBDC for barrier walls exceeding 3 m height based on the determined soil design parameters along the alignment of the noise barrier.") could potentially destroy all the effort dedicated to development of the noise barrier standards.

The Ontario Building Code does not have any provisions for the design of noise barriers. To specify the design in accordance with the Ontario Building Code could be interpreted that there would be no requirements for strength. We have been previously involved with exactly the same problem in the City of Nepean. A developer (who constructed a noise barrier that was going to be transferred to the City) claimed that the poorly constructed noise barrier would be satisfactory in accordance with the Ontario Building Code.

Presently, only OHBDC provides specific requirements for the design of noise barriers. To deliberately neglect the only design code that provides any protection from the above mentioned disputes would not be prudent. It should be noted that the transfer of infrastructure from developers to Municipalities or between Municipalities and Ministry of Transportation are quite common and in absence of design requirements could result in serious problems.

However, the problem goes much deeper than that. A noise barrier is a system of several structural elements that are interconnected through several joints which all have to be able to satisfy the design requirements. Once the restriction is removed the whole system is jeopardized. Neither the acoustical or material specifications can ensure a durable final product if the strength requirements are not observed.

Should the OHBDC Code be over-ruled for the noise barriers under 3 m, the well constructed noise barriers would gradually disappear from the market since they could not compete with the systems violating the design code.

In any case, it is quite unusual that a provincial design code would be over-ruled by a Municipal standard. When such a step is being taken it is usually in the other direction making the product safer and more durable.

It is not surprising that contractors, who are not able to construct noise barriers in accordance with the governing code in such a way that they could compete with the successful contractors, would like the standards to be lowered. However, it would perhaps be reasonable to advise them to lobby the Ministry of Transportation to change the design code.

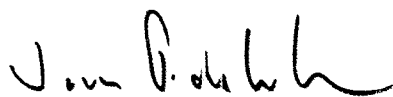
There are also other problems that must be considered. How could an Engineer acting on behalf of ROC review any proposed noise barrier design if the strength and load criteria are not known?

Even at the present time the design of noise barriers has some difficulties that could perhaps be addressed in the standard. The existing geotechnical manual suggests that soils located within the first 1.5 - 1.8 m (depending on snow cover) should not be used to provide horizontal resistance. Of course, this requirement would have a large impact on the noise barrier design. It would be very useful to clearly indicate ROC position on this point that could potentially result in disagreements. We usually consider noise barriers to be of lesser danger to the public safety than other structures and do not implement the above requirement in our designs. However, there is not a clear direction on this design point in any of the available design standards.

In closing, we wish to point out that in addition to the structural concerns hereto described, there may also be other important standards that could potentially influence your production.

Yours truly,

HARMER PODOLAK ENGINEERING CONSULTANTS INC.



Jan J. Podolak, P.Eng.
Vice-President



Ottawa-Carleton Home Builders' Association
Association d'Ottawa-Carleton des
constructeurs d'habitations

#203 - 30 Concourse Gate, Nepean ON K2E 7V7
Tel: (613)723-2926 Fax: (613)723-2982

February 9, 2000

Regional Municipality of Ottawa-Carleton
111 Lisgar Street
Ottawa, ON K2P 2L7

Attention: Mary Jo Woollam, Regional Clerk

**RE: NOISE BARRIER DESIGN STANDARDS
ITEM 11 - TRANSPORTATION COMMITTEE REPORT 53
COUNCIL AGENDA OF FEBRUARY 9, 2000**

Dear Ms. Woollam,

The Ottawa-Carleton Home Builders' Association has just learned that a report will be going to Regional Council today concerning Noise Barrier Design Standards. We are writing to ask that this item be deferred.

There are two key reasons why a deferral of this item is being requested:

- There has been no consultation with the development industry with regards to this issue. Particularly since the report has significant cost and design implications for builders and developers, we would certainly have expected to be consulted before this reached Council.
- The report recommends that reference to Ontario Building Code (OBC) standards be removed from the RMOC Design Standards and that all noise barriers be constructed to the significantly more costly OHBDC standards. We understand that noise barrier construction costs will increase by about 20% under this standard. Again, the development industry should have been consulted before these extra costs are imposed upon the industry and home buyers.

We hope that this issue can be deferred to allow builders and developers the opportunity to review this matter with the Planning and Development Approvals Department.

Should you have any comments or questions, please speak with either myself, Richard Lee (tel: 723-2926, e-mail: rlee@ochba.com) or Ray Watkins, Chair of the OCHBA's Builder/Developer Council at 596-2361.

Yours truly,

OTTAWA-CARLETON HOME BUILDERS' ASSOCIATION

Richard Lee
Executive Director

cc: Ray Watkins, Chair, Builder/Developer Council



March 20, 2000

RMOC
111 Lisgar Street
Ottawa, ON K2P 2L7

Attn: Mr. Brendan Reid, Head, Transportation Planning

RE: Proposed Noise Barrier Standard, RMOC, and your letter of 22-Feb-2000

Dear Sir,

We appreciate the opportunity to comment on this proposal, and are available for further discussion or presentations.

The proposal as it stands is very well done. There is one issue however that stands above the rest, and it is the amendment to remove OBC standards. We have been producing Noise Barriers in the region for over 15 years under the OBC and all without failure or lack of performance. It is our opinion that the OBC is practical for this purpose, and in most cases Bridge Code is overkill. It is critical to make standards as performance oriented as possible, and not draw hard lines causing the end result to be more expensive than necessary. The idea of Bridge Code is attractive as it pertains to some installation issues, like base design which in many cases we tend to exceed OBC standards. To make this as practical and cost effective as possible we feel the geotechnical consultant should have the authority in this regard to use their expertise on a project-by-project basis to determine the design requirement. The geotechnical consultant is required on the project in any case.

The issue may not be considered critical if the cost difference is a few percent, say less than 5%. It then could be said that it becomes prudent to reduce options to one standard ultimately reducing confusion and management issues in the long run. However, once the cost difference is 10% or more it is something the region should pay very careful attention to since this difference can amount to very large dollar amounts. In our opinion the average difference in cost based on our knowledge of most alternative suppliers in the marketplace is closer to 20 to 25%.

There are a few other comments and additions we would like to suggest. We have documented them in point form in relation to your above-mentioned letter.

Page 3 - Study Findings a) Bullet 2 - For clarification, Alcuf International's Warranty is 20 years on the frame and aluminum panel infill. The aluminum panel infill has an STC rating of 20.



Page 4 First Paragraph after 4 bullets - In summary, ... "the use of carefully designed wood barrier systems should be encouraged as wood barriers are cost effective and can be maintained with the least cost to homeowners." This is not correct, or at least not complete. Although in principle it is the correct approach and a reasonable observation, but it is a restrictive statement.

Aluminum infill is also cost effective and perhaps the most cost effective when you study the cost over time. Other composite materials that may or may not be on the market today will also achieve this. Our firm, and other competitors, are putting significant amounts of resources into researching alternative composites that we believe will outperform most offerings on the market today. These may become available in the very near future from any number of providers and should be included in such a standard.

Elsewhere in this document the use of metal is used which is inclusive of aluminum or steel. Some places the word steel is used where metal would be more appropriate. Possibly the words "metal or composite materials" is a better approach in general, and in most cases here.

Page 10 2.1.1 bullet 3, not sure how historically a 30 stc rating can be demonstrated without being tested as 20 or better. In other words bullet 3 is redundant to bullet 2.

Page 11 2.2 last line re joints. This is not clear to me.

Page 12 3.5 Steel Panels. No issues here, but this should either be reworked to include Aluminum and Composites i.e. entitle it "Metal or Composite Panels" or add two new sections, one for Aluminum Panels, and Composite Panels. Since sections exist for Wood and Concrete separately, perhaps the later makes more sense.

Page 13 3.7 b. - ... "treated with finished cut edges and to be" seems incomplete. I think you intended something like "treated with finished cut edges treated or protected from moisture penetration, and to be"...

Page 14 4.2 I believe the same way the Acoustical Consultant is responsible for providing height and alignment details on a project-by-project basis in 4.1, the Geotechnical Consultant should be responsible for providing base design parameters on a project-by-project basis.

Page 17 11.9 the term Engineer is not clear as to who's Engineer. Is it the Regions Engineer or the Contractors?

Page 19 needs a definition for Geotechnical Consultant.

Page 20, this is not critical in any way, but I would argue that Prestige does not have a Steel Frame system. They have a wood frame system that is steel clad on the



horizontal rails.

We would prefer the Alcuf International description here read "Aluminum frame system with a variety of wood, aluminum, or composite infills".

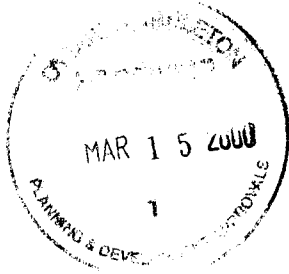
Thank you for your consideration in these matters, and an opportunity to comment.

We look forward to continuing work with the region, and are available for further discussions or comment as required.

Yours truly,

A handwritten signature in black ink, appearing to read "Harvey Parisien". The signature is fluid and cursive, with a prominent initial "H" and "P".

Harvey Parisien
Senior Vice President
parisien@alcuf.ca



Homeland® Vinyl Fencing Ltd.

2500 Williams Parkway East, Unit 49
Brampton, Ontario, Canada L6S 5M9
Tel: (905) 790-3400 Fax: (905) 790-3401

Mr. Brendan Reid
Region of Ottawa-Carleton
Planning Department
111 Lisgar Street
Ottawa, Ontario K2P 2L7

9 March 2000

Dear Mr. Reid,

Re: RMOC Proposed Noise Barrier Standard

Thank you for your 22 February letter and report attached.

Please find enclosed a revised Technical Manual on our Acoustic Fence System containing product details and engineering certifications to date.

I have reviewed the 21 December 1999 Report and do not disagree with standards being proposed. The only suggestion I wish to make is that "serious consideration" for selection of a noise barrier system for a specific project be given equally to all suppliers/manufacturers regardless of their plant location since material technologies and benefits vary considerably. In any selection local contractors can always be requested for installation of the product together with field support from the manufacturer.

In regards to the Suppliers/Manufacturers List under Annex B, wood posts are not used for our Acoustic Fence System. Please revise product description to read:

"Galvanized steel posts and panels finished with extruded vinyl (PVC) covers."

Unfortunately I will not be able to attend the 29 March meeting but look forward to details of that meeting when available. Thank you again for considering Homeland fence products.

Should you have any questions or need further information, please do not hesitate to call me.

Yours truly,

Homeland Vinyl Fencing Ltd.

Gino Aquino
President

GA/cl/encl.

cc. Mr. Hazem Gidamy, S.S. Wilson Associates



Ottawa-Carleton
Home Builders'
Association

*Builder
Developer
Council*

March 31, 2000

Regional Municipality of Ottawa-Carleton
111 Lisgar Street
Ottawa, Ontario
K2P 2L7

Attention: Mr. Brendan Reid
Head, Transportation Planning Branch

RE: PROPOSED NOISE BARRIER DESIGN STANDARD

Dear Mr. Reid,

Further to your letter dated February 28th, 2000 regarding the proposed noise barrier design standard, we are writing to bring forward our comments on the proposal.

The proposal is well done and does a good job of clarifying and standardizing the noise barriers for the Region. However the deletion the OBC standard for barrier wall heights of less than 3.0 metres is the one point that we think is unnecessary. Our past experience indicates to us that using the OBC standard is more than adequate for fences up to 3.0 metres in height.

We think that a more prudent and effective method of determining which standard to use is by assessing each situation individually, with the help of a geotechnical consultant if necessary. The same rationale is used for road construction—the Region has a minimum granular B thickness specified in road standards, but if bad soil is encountered the thickness of the granular B is increased to compensate for the situation.

Also the report makes mention of the cost difference between the two standards to be 10% to 15%—we think it is in the difference is in the order of 20% to 25%. Therefore we are of the opinion that the OHBDC standard for all noise barriers is not cost effective and will impose design criteria that are excessively stringent.

In closing, we want to thank-you for the opportunity to comment on the report. We remain available to discuss this matter further with you before you report back to Transportation Committee on April 19, 2000.

Yours truly,

BUILDER / DEVELOPER COUNCIL

Richard Lee

cc: Ray Watkins, Chair, Builder/Developer Council



P 1 of 2

Mr. Bob Chiarelli, Regional Chair
Region of Ottawa-Carleton
111 Lisgar Street
Ottawa, ON K2P 2L7
March 20, 2000

Re: Noise Barrier Design Standards Proposal

Dear Mr. Chiarelli,

As President of the South March (Kanata) Community Association, I was recently approached by Nicholas Heins, President of Prestige Fence. Mr. Heins informed me of the Noise Barrier Design Standards Proposal to be reviewed by the Transportation Committee at the end of March 2000. I have had the opportunity to review the following documents concerning this issue:

1. Region of Ottawa-Carleton Report, File No 42-98-0008, Dated 21 December 1999, To Coordinator Transportation Committee From Planning and Development Approvals Department Commissioner Subject: Noise Barrier Design Standards Proposal.
2. Letter to Mr. Bob Chiarelli, Regional Chair from Mr. Nicholas Heins, President of Prestige Fence, Dated February 29, 2000
3. Independent Report by Harmer Podolak Engineering Consultants Inc.
4. List of specific concerns regarding the lower standards proposal, by Nicholas Heins
5. Photographs of Noise Barriers that meet the Ontario Highway Bridge Code, and a photo of a ten to fifteen year old fence, which would meet the proposed Ontario Building Code Standard.

I have had the opportunity to discuss the proposal with the SM(K)CA executive, a member of the SM(K)CA planning committee and Regional Councillor Alex Munter. I also informed the SM(K)CA membership at our monthly meeting on March 15, 2000. Consequently, the SM(K)CA wish to make the following comments:

- The lowering of Noise Barrier Standards from the current Ontario Highway Bridge Code to the Ontario Building Code will ultimately increase maintenance costs. Unlike the Ontario Building Code, the Ontario Highway Bridge Code specifically addresses standards of Noise Barriers. Consequently, the lowering of standards to the Ontario Building Code will allow for the installation of inadequate Noise Barriers, which will fail to stand up to wind pressures and snow loading.
- Noise Barriers that have failed, not only cease to be adequate barriers against traffic noise, but look extremely unattractive thus affecting the beauty of our communities.
- Noise Barriers that have failed have a tendency to lean or collapse and are unsafe, especially for children.
- Homeowners are highly unlikely to repair failing or failed Noise Barriers. To place the responsibility for this on homeowners is unreasonable.
- The Region should expect Noise Barriers to have at least a minimum of 20 years life expectancy. This will eliminate the expense of replacing failed Noise Barriers seven or ten years after installation and will ensure that taxpayers receive the highest quality product.

Executive Committee

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Vice President
Director
Director
Secretary-Treasurer
Past President

Tracey Hagyard, 88 Acklam Terrace, 591-1527
Ken Gelok, 35 Ayton La., 591-2638
Derrick Wigney, 23 Helmsdale Dr., 592-4200
Ann Kiggins, 40 Inverary Dr., 599-3035
Joe Charron, 58 Beacon Way, 592-0899
Doug Lock, 12 Kimbolton Cr., 599-8920



P 2 of 2

- Companies or individuals who wish to lower the standards of Noise Barriers are unwilling to make an investment in engineering and product design in order to ensure good quality Sound Barriers in our communities. They fail to see the overwhelming advantage in having structurally sound and attractive Noise Barriers, which make a major contribution to the attractiveness of our city.

The South March (Kanata) Community Association respectfully request that the Transportation Committee seriously consider the aforementioned concerns regarding the lowering of Noise Barrier Standards.

Sincerely,

A handwritten signature in black ink that reads 'Tracey Hagyard'.

Tracey Hagyard
President

cc.

Alex Munter, Regional Councilor
Merle Nicholds, Mayor of Kanata
Shiela McKee, Councilor Ward One, Kanata
Mary Jarvis, Planner, Minto Land Development Corporation
Nicholas Heins, President, Prestige Fence

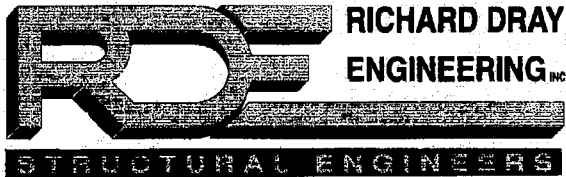
Transportation Committee

Diane Holmes, Chair
Michel Bellemare
Wendy Byrne
Cantin Richard
Linda Davis
Clive Doucet
Herb Kreling
Jacques Legendre
Molly McGoldrick-Larsen
Madeleine Meilieur

Executive Committee

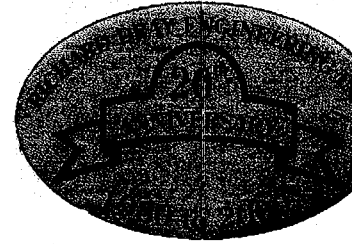
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Telephone: (519) 927-9288
Fax: (519) 927-9299
Email: rde@rde.on.ca



March 29, 2000

HDE#2036

Mr. Enzo Pensa
International Fence
1917 Albion Road
Rexdale, Ontario
M9W 5K7

Dear Mr. Pensa:

**Re: Region of Ottawa Carleton
Proposed Noise Barrier Design Standard**

At your request, we have reviewed the above noted proposed standard. In addition, we have reviewed the departmental recommendations and the related report, both of which were submitted with the standard. The report was provided to explain the basis on which the recommendations were written. Although the recommendations are well thought out and clearly written and intended to be in the best interests of both the regional government who will administer the standards and to the public who will be served by the standards, we have some comments based on our experience as a consulting engineer. We hope these comments may be of assistance in your evaluation of this proposed standard.

During my work as a structural engineer, I have had the privilege to have worked for and consulted to the precast concrete industry for over 30 years. In addition, for a period of 3 1/2 years during that 30 year span, I worked as a consultant to the Canadian Standards Association (CSA) as the engineer responsible for the certification of over 70 precast concrete manufacturing facilities across Canada. The experience gained working with the CSA, combined with my responsibilities as a specialist consultant responsible for the design and repair of large concrete water retaining structures, has given me an understanding of concrete and a valuable insight into the design of concrete structures. These structures include the specialized design for the precast fence panels which were developed for **International Fence Inc.** Therefore, based on this experience, we have the following comments on the proposed standards.

1. A 20 year guarantee, as noted in the report, is not offered for all products available. Therefore, the report concludes on Page 5 at 'Bullet 4', "it is not

Mr. Enzo Pensa
International Fence

March 29, 2000
Page 2 of 4

possible to construct a barrier and provide a 20 year full warranty on the labour and material without a significant cost increase to the developer and the homeowner". The basis of this opinion is provided on page 3 of the report, under the heading "Study Findings", Paragraph (a). However, as summarized in the following points, there are a wide range of products which appear to meet the 20 year requirement included in this section. These are as follows:

1. **International Fence** provides a 20 year warranty.
2. Steel sound barriers can be designed to provide a 20 year warranty.
3. Wood fences, especially western red cedar, can be designed to provide a 20 year warranty.
4. Theoretically, the pressure-treated wood can be designed to provide a 20 year warranty.

In summary, the report seems to contradict itself with respect to the availability and practicability of a 20 year warranty. Notwithstanding, it would appear that an acceptable 20 year warranty can be provided with the available products and that the market demand will develop competitive responses to this requirement.

2. The present cost of sound barrier fences can vary from \$40.00 per linear foot to over \$100.00 per linear foot of wall and this cost can be expected to rise over time as a result of inflation. On page 4 of the submission, under the heading "Study Findings", Paragraph (b), the report states, "The choice by CSA of 20 years maintenance free lifespan for barrier materials is rather arbitrary and not warranted. There are many popular home products and materials that do not have such a requirement and homeowners have accepted their maintenance after several years of service". However, in 10 to 15 years when, in all probability, the cost of fencing will rise to possibly \$120.00 per linear foot for the most economical fence, will this cost not be a tremendous burden to place on the budgets of the homeowners who may not be able to afford the repair? Therefore, the selection of a fence should, in our opinion, be based on both longevity and cost effectiveness with the balance tilted toward the side of longevity.
3. The foundations required for all fence panels are the most important and most "problematic" portion of the construction of the fence. The concrete, "caisson" foundation is very durable and, using designed air

entrained concrete, it could last significantly longer than the fence superstructure. The steel posts, which are incorporated into both the precast and steel panel designs, can be painted or even replaced as part of any maintenance scheme. However, wood posts will rot within the concrete and thereby this system will require the replacement of both the wood post and the "caisson" foundations. In addition, the finish on the wood deteriorates relatively rapidly and must be replaced on a regular basis to maintain a reasonable appearance for the fence. However, one individual along the line of fence, not maintaining their section of fence could result in the failure of the adjacent sections being maintained by their neighbours. Therefore, the statement on page 4, 'Bullet' 4 of the report, "However, the use of carefully designed wood barrier systems should be encouraged as wood barriers are cost effective and can be maintained at the least cost to homeowners" must be carefully reviewed because the historical evidence may not support this position.

4. There are several precast panels systems which do not conform to the requirements of the CSA, A23 Series Standards with respect to the placement of reinforcement and the quality of the concrete provided. As a result, although these products are on the market, the manufacturer will not warranty these products because the product does not conform to these standards, which are based on the quality and durability of the resultant concrete. However, we would add that these products cost approximately the same as the conforming fences. Therefore, in our opinion, a product should not be considered if it does not meet the requirement of these design and manufacturing standards. Please note that the above referenced standards are not related to or part of the proposed CSA standard for fence design but are the industry and building code minimum standards for design in concrete.
5. The present monopoly in the manufacture and supply of fence panels exists only in the field of sound absorbing fence panels. The remainder of the industry is very competitive and will continue to be so. In addition, as you are aware, "wet" cast concrete, which include most of the precast concrete manufactured in Canada, is a very well understood and proven process for manufacturing precast units. Further, the use of ready mix concrete greatly reduces the capital costs allowing competitive suppliers to enter the market at any time. Finally, a wet cast precast concrete fence, properly designed, will have a virtually maintenance free life expectancy well in excess of the CSA recommended 20 year period.

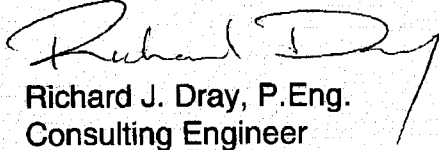
**Mr. Enzo Pensa
International Fence**

**March 29, 2000
Page 4 of 4**

If there are any questions, please do not hesitate to contact our office.

Yours truly,

RICHARD DRAY ENGINEERING INC.


Richard J. Dray, P.Eng.
Consulting Engineer



RD:wo

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Distribution: Brendan Reid - Region of Ottawa-Carleton

PRESTIGE FENCE

163 Cardevco Rd.
RR#2 Carp On.
K0A-1L0

30 March, 2000

Mr. Brendan Reid
Transportation and Planning
RMOC
111 Lisgar Street
Ottawa, On.
K2P-2L7

Dear Mr. Reid

Thank you for the letter of March 27. I am including a copy of a letter I sent to Bob Chiarelli February 29th, a copy of a letter sent by the South March Community Association and a copy of the concerns I voiced at the Transportation Committee meeting February 2nd.

I would like an opportunity to address the committee and answer any questions during the next appropriate Transportation Committee meeting. The Community association may also wish to speak at this meeting.

Please advise me when this meeting will take place or any other meetings that will pertain to this matter.

Please call me if you have any questions (831-2073)

Yours Truly,



Nicholas Heins
President

PRESTIGE FENCE

Division of N.G.H. Industries Inc.
163 Cardevco Rd.
RR#2 Carp On.
K0A-1L0

Region Of Ottawa Carleton
111 Lisgar St.
Ottawa, On.
K2P-2L7

COPY

February 29, 2000

Attn: Bob Chiarelli
Re: Noise Barrier Design Standards Proposal

Prestige Fence was founded 14 years ago while I was going to The University of Ottawa. During this time I have been given a New Ventures award by the Ontario Government, I was the Ottawa Board of Trade "Young Entrepreneur Of The Year" in 1994, and was named to the "Top 40 Under 40" list by Ottawa Business Magazine in 1995. As a past director of the Ottawa Carleton Homebuilders Association I am also very involved with many of the Ottawa area homebuilders. My business consists of manufacturing and installing Fences, Decks and Sound Barriers for Homebuilders, Developers, Municipalities and the Region.

On February 2nd I addressed the Transportation Committee raising a number of concerns regarding the above mentioned proposal. The proposal drafted by a Toronto engineering firm recommended that the design standards for building Sound Barriers along roadways be LOWERED from the present Ontario Highway Bridge Code to the Ontario Building Code. At the meeting the Transportation Committee agreed with the facts I presented and voted to maintain the current Ontario Bridge Code Standard and not lower it to the Ontario Building Code. Unfortunately at the following general council meeting it was referred back to the Transportation Committee for further review.

This is a very important issue for the Region since lowering the Standards will result in increased maintenance costs and ultimately affect the beauty of our communities.

I am including the following list of documents:

1. The Noise Barrier Design Standards Proposal.
2. List of specific concerns I have with the proposal.
3. Independent Engineers Report.
4. Photographs of Sound Barriers that meet the Bridge Code Standard and a picture of a 10-15 year old fence that would meet the proposed Building Code Standard.

I would be grateful if you would take some time to review these documents before the issue is raised at the Transportation Committee meeting at the end of March.

I would be pleased to discuss this matter with you at your earliest convenience.

Please don't hesitate to call me at 831-2073.

Sincerely,

Nicholas Heins

ATTACHMENT #2
“Concerns Regarding Lowering Of Standards”

1. There are 4-5 Sound Barrier companies operating within the region and they have all satisfied the 1996 RMOC Guidelines and have installed their respective products in the Region. Since these 1996 Guidelines require Ontario Bridge Code on all heights of sound barriers and these companies have met these guidelines there should be no concern about monopoly business practices.
2. If item 4.2 is adopted and Sound Barriers under 3m high are designed to Ontario Building Code then there will be a return to building sound barriers like the ones on Hunt Club Road were 7+ years ago. Most of which have had to be upgraded or removed in order to repair leaning and rotting posts, failing joints or the fence simply falling apart. Had the Barriers been designed to the Ontario Bridge Code they would still be there today and the costly repairs would not have had to be done.
3. Item 6.2 states that by lowering the standards higher quality noise barriers and lower maintenance costs will result. This statement is simply untrue. In fact the quality will be lower and your maintenance costs higher. Sound Barriers designed according to the Ontario Bridge Code will not only be of far higher quality but will last longer and therefore have lower maintenance costs. For instance, the backbone and most expensive components of any Sound Barrier is the footing and post. By reducing the standard the footing size and depth will be reduced as will the post size. The resulting sound barrier will not be able to withstand the same wind pressures or snow loading that a Sound Barrier designed to the Ontario Bridge Code can, and therefore the barrier will begin to lean at an earlier stage. Repairing any footing or post is very expensive.
4. With respect to the proposal's idea of building a barrier that can be maintained by the public, in my 14 years experience, most homeowners are not able nor do they want to do their own repairs. This is especially evident when it comes to repairing or replacing a footing or post. Sound Barrier installations on Regional property are maintained by the Region. Consequently the Region should continue to build Sound Barriers using the existing higher standards resulting in lower maintenance.
5. Although a 20 year warranty on the complete product would be difficult, I do however feel that an expectation of a 20 year + lifespan with minimal maintenance should be FULLY expected by the region. For example, when buying a home customers usually receive a 2-3 year warranty from the builder but the customer's expectations are for the home to last a lifetime with only minimal repairs. The Region should be holding Sound Barrier manufactures to the highest standard which is the Ontario Bridge Code. By doing so the public will be assured of a quality product.

6. There is also the aesthetic value to consider. The situation in Toronto clearly demonstrates the case against lowering the standards. The Sound Barriers built around Toronto using the lower standard are leaning, have heaved and are in various stages of disrepair. Many of these barriers are less than 10 years old. These barriers are the first thing anyone sees going into a community so it benefits both the developer as well as the Region to have well built and long lasting Sound Barriers.

7. As a final concern I would like to point out that it has taken the last 5-6 years since the new standards were introduced for wood sound barriers in particular to gain back the trust of the market that was lost when the earlier sound barriers were falling apart due to the lower standards.

It is my opinion that the companies or individuals that expressed some concern as to the Regions existing noise barrier standards did so because they were not willing to make a small investment in engineering and designing a product to meet these standards. The companies already approved and working within the region are proof that the Ontario Bridge Code Standards can be met.

Other than a few items of the 1996 RMOC Standard that could be reviewed it is a sound standard that ensures a high quality product.

Durisol Inc.

Durisol®

March 30, 2000

Region of Ottawa-Carleton
Ottawa-Carleton Centre, Cartier Square
Planning & Development Approvals Department
111 Lisgar Street
Ottawa, Ontario
K2P 2L7

Attention: **Mr. Brendan Reid**
Head, Transportation Planning

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Hamilton, Ontario
Canada L8P 4M3
Tel: (905) 521-0999
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Manufacturing
P.O. Box 400
216 St. George Street
Mitchell, Ontario
Canada NOK 1N0
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Dear Brendan Reid,

We thank you for forwarding a copy of the Proposed Revisions to the RMOC Standards for Noise Barriers, and are pleased to provide the following comments, as requested.

Durisol has been supplying noise barrier systems in the Ottawa Region since 1988, for a range of clients, including the RMOC, private developers, MTO and private industry. To date, approximately 15,000 linear meters of noise barriers have been installed with various wall heights and designs. Durisol is currently installing noise barrier walls for private developers in both the South and East Urban Communities.

Durisol has also been fortunate to supply noise barrier system to almost every major municipality in Ontario, including Hamilton/Wentworth, Peel Region, Kitchener/Waterloo, Sarnia, City of London, City of Toronto, City of Mississauga, etc. We are very familiar with many "standards" that have been adopted by these areas and revisions to these standards that have occurred over the past 15 years. Our opinion is that the trend has been to adopt a more stringent noise barrier policy to ensure the durability and integrity of wall systems. Many municipalities which allowed low cost wood or concrete systems to be installed are now implementing retrofit programs to repair these walls, some which have only been in place for ten years or less. Cost estimates for these wall replacement programs is in the tens of millions of dollars. Certainly wood acoustic barriers are cheap to supply and install; however, the life cycle cost of these systems must be considered. There are wood wall systems on the market that are a durable system which meet the requirements of the final draft of CSA Standards for noise walls. We certainly endorse the adoption of the CSA Standard by municipalities, as it imposes rigid specifications for wood noise wall systems.

We have concerns relative to the revised specifications for the use of wood systems in the proposed Noise Barrier Standards for RMOC. Although you have imposed rigid criteria for Precast, Steel, Cast-in-Place and Masonry Noise Wall Systems, (i.e. - adherence to CSA Standards), the requirements for wood wall systems do not have to meet CSA, and, in our opinion, are contradictory to your main objective of ensuring durable wall systems for use within the Region. We also feel that the inclusion of reference to the Ontario Building Code and Ontario Highway Bridge Design Code are important and should remain as part of your revised proposal.

Your proposed Guarantee and Maintenance Period is commendable, as is the three year review by an Engineer. However, one only needs to drive through the City of Kanata and observe the condition of the many wood walls constructed over the past 15 years. In fact, many of the wooden noise walls installed through RMOC in the past ten years would have met your new proposed criteria for wood walls at the time of installation. With the exception of some recent wood noise walls that have been properly designed and constructed, almost all of the wooden walls now exhibit the problems that you are addressing in the revised standard. Who will enforce that the wood systems meet your criteria, after the three year review?

Durisol Inc.

Durisol.

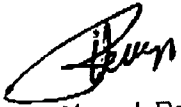
Mr. Brendan Region
March 30, 2000
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Certainly wood walls are suited for some residential development applications as privacy screens; however, their use along Regional Road Arterials and Collectors, as true noise barriers have not stood the test of time well.

We also note that for the requirements of absorptive noise wall systems, no specification for durability, i.e. - freeze-thaw resistance, salt scaling and resistance to deicing chemicals, have been indicated. These are vital criteria for absorptive systems that should be included in your proposal.

We hope the above comments are useful to the Region, and again, we appreciate being included in the circulation of the new proposed Standards. We could certainly provide further information, if required, and would be pleased to attend any upcoming meetings to discuss the topics more specifically. We would appreciate to be kept informed as to the ongoing status of the revised proposal.

Yours very truly,
DURISOL INC.



Hans J. Rerup, P.Eng.
President

HJR:el

cc: Michael K. Edwards, Durisol Inc.

Kanata Council of Community Associations
c/o 88 Acklam Terrace
Kanata
K2K 2J1

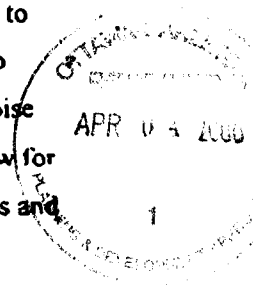
Mr. Brendan Reid, Head of Transportation and Planning Division
Region of Ottawa-Carleton
111 Lisgar Street
Ottawa, ON K2P 2L7
March 29, 2000

Re: Noise Barrier Design Standards Proposal

Dear Mr. Reid,

The Kanata Council of Community Associations, would like to raise the following concerns regarding the proposed LOWERING of Noise Barrier Standards:

- The lowering of Noise Barrier Standards from the current Ontario Highway Bridge Code to the Ontario Building Code will ultimately increase maintenance costs. Unlike the Ontario Building Code, the Ontario Highway Bridge Code specifically addresses standards of Noise Barriers. Consequently, the lowering of standards to the Ontario Building Code will allow for the installation of inadequate Noise Barriers, which will fail to stand up to wind pressures and snow loading.
- Noise Barriers that have failed, not only cease to be adequate barriers against traffic noise, but look extremely unattractive thus affecting the beauty of our communities.
- Noise Barriers that have failed have a tendency to lean or collapse and are unsafe, especially for children.
- Homeowners are highly unlikely to repair failing or failed Noise Barriers. To place the responsibility for this on homeowners is unreasonable.
- The Region should expect Noise Barriers to have at least a minimum of 20 years life expectancy. This will eliminate the expense of replacing failed Noise Barriers seven or ten years after installation and will ensure that taxpayers receive the highest quality product.
- Companies or individuals who wish to lower the standards of Noise Barriers are unwilling to make an investment in engineering and product design in order to ensure good quality Sound Barriers in our communities. They fail to see the overwhelming advantage in having structurally sound and attractive Noise Barriers, which make a major contribution to the attractiveness of our city.



The Kanata Council of Community Associations requests that the Transportation and Planning Division seriously consider the aforementioned concerns regarding the lowering of Noise Barrier Standards.

Sincerely,

Tracey Hagyard
Member of the Kanata Council of Community Associations

cc.

Bob Chiarelli, Regional Chair
Alex Munter, Regional Councilor
Merle Nicholds, Mayor of Kanata
Shiela McKee, Councilor Ward One, Kanata
Mary Jarvis, Planner, Minto Land Development Corporation
Nicholas Heins, President, Prestige Fence
Transportation Committee
Diane Holmes, Chair
Michel Bellemare
Wendy Byrne
Cantin Richard
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Clive Doucet
Herb Kroling
Jacques Legendre
Molly McGoldrick-Larsen
Madcleine Meilleur