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Evergreen Buffers as Screens in Landscapes

Ar. Navin Gupta [1], Ar. Anoop Kumar Sharma[2], Ar. Vishal Bhatti[3]

[1,2]*Assistant Professor, School of Architecture & Landscape Design, SMVDU, J&K, India*
[3] *STA, School of Architecture & Landscape Design, SMVDU, J&K, India*

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1. INTRODUCTION

Screens and hedges are a popular way to create isolation or hide an undesirable view/sight. They can be anything from a section of a fence to individually designed panels, brick walls or a wall of green plant material. Plantings such as shrubs are usually a less expensive way to create privacy than a fence or wall. Screens or hedges also offer supplementary advantages to many landscapes other than privacy. For example, they can enclose a terrace or provide a background to a herbaceous garden or other garden features. Screens are loosely defined as evergreen, with steady growth habits which mature at about shoulder height.

Evergreen plants with low-branching behavior and thick foliage are most effective for screening and providing the most privacy, especially in winter. In neighborhoods with small lots, inter-planting with evergreens and deciduous plants offers a more fascinating landscape than a single row of evergreen trees and shrubs. This topic discusses basic landscape tools and guidelines for optimizing sound reduction and visual screening. Keep in mind that distance, height, density of materials used, and cost considerations will determine what can reasonably be accomplished. Residents can achieve success with a number of methods

2. Impacting Noise Pollution

Residents can accomplish success with a number of methods that reduces noise pollution, including building walls, planting vegetation, and creating fountains that camouflage offensive sounds. Research shows it is more effective to use a versatile approach to noise reduction rather than a single tool. Well planned efforts may reduce noise levels by as much as 50%.

- Increase personal distance from the sound source. Most loud sounds will dissipate over extended distances.
- Use structures (walls and berms) and vegetation (grass, shrubs and trees) to break sound lines. Don't hesitate to use all resources at hand, particularly existing vegetation.
- Utilize and economize all space. A combination of distance, structures, and vegetation will provide the most benefit.

When trying to reduce noise levels it is important to absorb, deflect, and muffle intrusive sound as close to the source as possible. For most homeowners that point is the property line.

3. Opportunities and Materials

Berms – Earthen berms help absorb noise from low elevation sound sources. Construction should be at least 3 feet wide for every 1 foot in height, and planted with appropriate grasses or shrubs.

Walls – Sound barrier walls reflect and deflect noise. They may be constructed of stone, concrete, wood or recycled structural materials. Denser materials create greater sound deflection and absorption. The closer the wall is to the sound source, the more the sound will be reduced. Often, a short wall close to the source will provide the same impact as a much larger structure further away. A wall-height barrier that screens the source from view is usually sufficient. Each increased meter of wall height above the line of sight attenuates sound by as much as 1.5 db(A).

Vegetation – Plant materials help attenuate sound and "calm" the noise. Some types of plants are better at performing this function than others. Efficient trees and shrubs have thick, waxy leaves, dense evergreen foliage, and branches that extend to the ground. One should choose plants carefully, paying particular attention to ease of maintenance and the preferred effect. For a formal look, plants must be clipped, which is time-consuming and an often-repeated task. An informal, more natural appearance can be obtained with less maintenance using evergreen and deciduous plants. These plants can also provide other pleasing landscape qualities such as flowering, showy fruit, fall leaf color and a variety of canopy forms. Also, consider the mature size of the plants compared to the areas in the landscape. In an area where space is limited, like a side yard, use narrow or upright tree forms. These will provide the necessary height needed for screening, but will not overpower the width of the area. A mixture of plants such as small flowering trees, evergreen trees and shrubs creates great eye appeal and will ensure against a total loss if there is a disease or insect problem with one of the species. If fast-growing plants (i.e. Lombardy poplar, white pine) are used for an instant screen, be aware that many are weak-wooded and short-lived. An inter-planting of longer-lived species (i.e.

holly, arborvitae) will fill in the vacant spots when the fast growing plants die or are removed.

4. Procedures for Noise Screening

1. Determine the cause of the noise and the area to be screened. Heavy traffic noise will likely require a scheme similar to the detail shown below. This requires a minimum of dense shrubs, a solid wall (wood, stone, or recycled material), and two rows of evergreen trees.

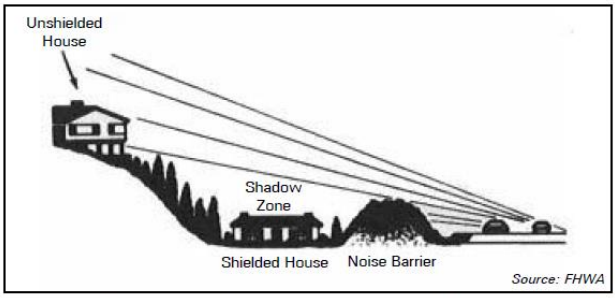
2. Should traffic noise be of a lighter nature, a berm and shrubs may be sufficient. These tools should be placed as close to the sound source or curb as possible. On occasion, a simple, low wall and shrub planting will suffice.

3. Make sure the shrub planting is designed for individual plants to overlap and eventually touch as they grow large. This will provide an uninterrupted buffer of foliage.

4. Allow adequate space for the growth of the trees and shrubs, and don't crowd them too close together. An effective planting plan will screen more noise over time.

5. Tree plantings should be staged in two staggered rows (where space allows), to provide visual screening of the sound source.

6. A typical buffer for heavy noise reduction might appear as shown below. Note the integrated and overlapping plantings with each feature suited to the site.



Design note: Noise reduction in urban environments is a matter of "getting in the way" of the sound with the "right materials." A significant amount of the perceived sound attenuation is a function of the sound source being "out of sight." This may require different strategies for different types of situations (i.e. a second story window will require a different screen type than would a first floor patio). Remember, home surfaces (walls and cement) also reflect sound and may serve to accentuate noise problems if not screened.

Figure : 1

5. Establishing Visual Screens

Visual screening has become a more frequent challenge for homeowners. Established residents may disagree with new neighbors about what looks acceptable. New homeowners may find themselves "too close" to their neighbors' windows.

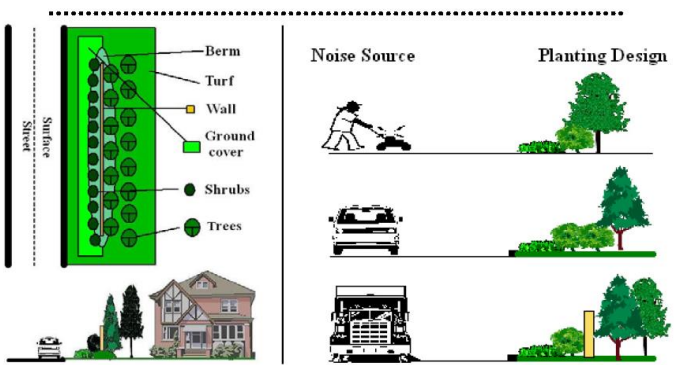


Figure : 2

When mutual effort is put into the design and establishment of a screen, the desired effect has a greater chance of pleasing all homeowners. Visual screening may be easier and less expensive to achieve depending upon the level of screening desired (a 100% visual screen can be very expensive and difficult to achieve in a short period of time), if you follow a few basic principles.

6. Procedure for Visual Screening

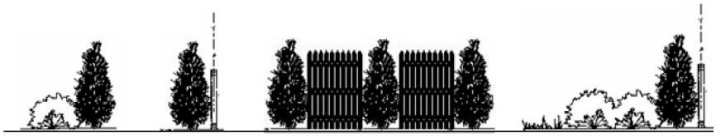
The basic principles of visual screening are the same as those for buffering sound, except that visual screens may not need the same level of occlusion to achieve desired results.

1. Determine the length and height of the area to be screened. An elevated visual problem, such as a second story window, may require the use of a berm and taller trees to get the desired results.

2. Check to see how the view changes from different vantage points around your yard and home. Attempt to have the screening plan address all these views.

3. Usually, a simple multi-row planting of a combination of trees and shrubs will suffice. Make sure the shrub planting is designed for individual plants to overlap and eventually touch as they grows large.

4. Where only trees are used, plantings should be of two staggered rows (where space allows), to provide visual screening. Remember to allow for the growth of the trees and shrubs, and don't crowd them too close together.



There may be a need for a variety of vegetation/fence combinations to achieve the required level of screening.

Figure : 3

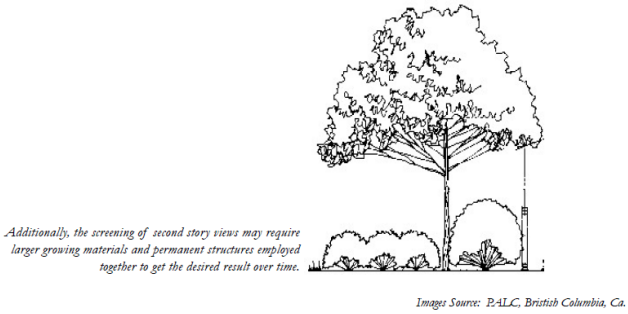


Figure : 4

7. Recommended plant materials for screening / noise abatement

Table : 1

Recommended trees			
Scientific name	**Common name**	**Height (in feet)**	**Spacing (c/c)**
Saraca asoca	Asoka	20’ to 30’	10’
Samanea saman	Rain tree	40’ to 75’	30’
Bignonia megapotamica	Rio grande trumpet flower	20’ to 30’	20’
Tamarindus indica	Tamarind	30’ to 75’	30’
Millingtonia hortensis	Cork tree	30’ to 75’	30’
Acacia arabica	Babul	20’ to 30’	15’
Thespesia populnea	Umbrella tree	20’ to 30’	20’
Couroupita guianensis	Canon ball tree	30’ to 60’	25’
Pterospermum acerifolium	Karnikar	30’ to 40’	25’
Calophyllum inophyllum	Alexandrian laurel	40’ to 60’	25’
Ziziphus iuiuba	Indian jujube	40’ to 75’	30’
Polyalthia longifolia	Mast tree	20’ to 40’	15’
Acaciaauriculiformis	Earpod wattle	30’ to 40’	20’
Magnolia grandiflora	Southern magnolia	20’ to 25’	15’
Ficus benjamina	Weeping fig	20’ to 25’	15’
Drytetes roxburghii	Putranjiva	30’ to 40’	20’
Mallotus philipennsis	Kamala	15’ to 25’	15’
Plumeria obtusa	White frangipani	10’ to 15’	10’
Alstonia scholaris	Devil’s tree	20’ to 40’	15’
Artocarpus Heterophyllus	Katthal	25’ to 40’	20’
Cupressus sempevirens	Italian cypress	20’ to 25’	10’
Taxodium mucronatum	Montezuma cypress	25’ to 35’	10’
Mesua ferrea	Nagkesar	12’ to 18’	10’
Thuja occidentalis	Arborvitae	30’ to 40’	10’

Table : 2

Recommended shrubs			
Scientific name	**Common name**	**Height (in feet)**	**Spacing (c/c)**
Duranta plumieri	Golden dewdrop	7’ to 10’	4’
Nerium odorum	Oleander	6’ to 8’	3’
Bougainvillea	-	6’ to 8’	4’
Ochna squarrosa	Golden champak	6’ to 8’	4’
Thevetia peruviana	Yellow oleander	6’ to 8’	4’
Euphorbia neriifolia	Thor	8’ to 12’	6’
Duranta	Duranta	8’ to 10’	2’
Clerodedron inermi	Indian privet	6’ to 8’	3’
Murraya exotica	Kamani	8’ to 10’	3’
Dodonea viscosa	Hop bush	4’ to 6’	3’
Ligustrum ovalifolium	Common privet	10’ to 15’	5’
Sesbania aegyptiaca	Jainta	6’ to 8’	4’
Thuja orientalis	Biota	6’ to 10’	4’

8. CONCLUSIONS

Living screens can enhance privacy, cover an unsightly garden area, and provide shade. They can mitigate noise and provide passive heating and cooling. They can offer habitat for bees, butterflies, hummingbirds, and other beneficial creatures who share your space. They can be used to create alluring "outdoor rooms" within your own garden. They can even serve as a food source. The conventional landscaper’s approach to creating a residential hedge is to identify one evergreen shrub and plant it continuously in a straight line. Modern landscapers recognize the weakness of this type of planting. Besides being dull in appearance, it lacks healthy diversity. A single-species hedge creates an excellent opportunity for pests and plant disease: If one plant is diseased or pest-ridden, the problem will travel all the way down the hedge line. In building your hedge, therefore, the best options are :

1) choose multiple varieties of one species; or

2) choose multiple species.

The variety of species adds interest in the landscape across multiple seasons; gives fragrance to the garden; and creates bee, butterfly, and hummingbird habitat while providing a user-friendly solution for privacy. For the best Green Living Screen, plan for a 4' to 6' wide space. One needs to consider the heights of any existing cables, phone lines, or electrical infrastructure. Small plants will grow large, and it can be

very costly to remove or even trim unwanted foliage from electrical wiring. The mature size of any Living Screen plants should be a primary determining factor in the height of the screen. Normal height for residential division is 6' to 8' which obscures most objects from the standard line-of-sight, but it might also be wise to check with any city regulations or subdivision covenants. Additional height may be needed for screening purposes as in the case of obscuring an old shed or building. The length of the screen should be determined by the length of the view to be blocked.

Planting a Living Screen for Noise Abatement is defined as planting a combination of plants that can absorb noise or greatly reduce it. Most noise begins at the street level, but planting a long row of green will do little to impact on street noise. Several landscape elements added to the design can enhance the noise absorption level. For instance, the addition of a 3' to 4' tall Berm or a 40% Slope can reflect the noise backward or deflect it upward. Other features such as retaining walls, 3' solid fencing features or large boulders placed into a natural "slope" design can assist in the deflection of pavement noise. The closer these features are placed to the street or noise, the better.

Research indicates that even the densest green barrier will only minimize sound, but not eradicate it. A solution may be to consider Noise Competition not elimination. The installation of bubbling fountains, pools, waterfalls and small, rippling streams can not only soothe the senses, but minimize city noise. Landscapers should recommend a comprehensive plan that includes combination of both plant material and distracting competition. One landscaper gives each of his clients a large wind chime when noise abatement is a landscape issue. The choice of plant materials in noise abatement is important. The plants should be evergreen in nature and capable of producing dense growth. Ideally, the solution is a Living Screen that grows up--not out and grows at a moderate rate to maturity.

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