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NOISE MODIFICATION

. . . and Landscape Plantings

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Excessive or unwanted sound becomes noise and represents an increasingly pronounced problem in urban areas, industrial centers and other highly populated or mechanized centers. Noise can increase to such an acute state that human health and happiness can be threatened and corrective measures must be activated.

Noise has two basic human effects of physical and/or psychological. Physical effects relate to the transmission and radiation of sound in the atmosphere and psychological effects associate with human responses to sound. With any noise problem, there are three elements of concern: sound, transmission paths, and the receiver.

The treatment for noise control is greatly dependent on the origin and frequency of the sound. The intensity of outdoor noises is reduced by distance and/or by absorbing elements between the source and the receiver. Also, climatic factors such as wind and temperature variations near the ground surface can combine to force sound upward.

Elements introduced between the sound source and the receiver can reduce or modify noise by absorption, deflection, reflection, refraction, and masking.

Absorption takes place when an element receives the sound waves and converts them to other energy forms and eventually to heat.

Deflection causes the sound to be bounced back towards the source.

Refraction is a noise dissipating process of dispersion when sound encounters a rough or porous surface.

Masking is the substitution of more desirable or pleasant sounds to dilute or override the noise such as music piped into a noisy office area.

The effectiveness of plantings on noise reduction is determined by the inter-relationship of:

the sound - its type, intensity, and origin

the plantings - type, height, density, and location

the climatic factors - wind direction and velocity, temperature, and humidity

A Summary of Emphasis Statements:

The vibrations of sound waves are absorbed by leaves, branches, and twigs of plants. Best results occur when plants have an abundance of thick, fleshy leaves with thin petiole that permit a high degree of flexibility and vibration.

Soft surfaces such as a lawn with tree or shrub borders cushion sound but hard surfaces such as paved highways and parking lots reflect and possibly amplify noises.

A planting width of 25 to 35 feet is effective for the screening of highway noise. Trees and shrubs should be combined for the area. To direct the noise upward, the plantings should be lower towards the sound and higher towards the hearer. Growth time is necessary for new plantings to reach an effective size.

A narrow planting - for year round effectiveness - should be predominately evergreens.

Plantings used in combination with earth forms (embankments or hill slopes) or other structural materials are more effective than any one of the barriers used alone.

Plants help to mask noises by sounds created by wind and rustling leaves, falling leaves, and the attraction of diversionary sound sources such as birds and small animals.

Plantings selected for noise control should be fully adapted to local climatic and soils conditions. Also, there must be a high state of tolerance for such conditions as vehicular exhaust fumes, reflected heat from paved surfaces, and other associated problems.

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