

2.4.2 OTHER STRUCTURES

2.4.2.4 NOISE WALLS

GENERAL DESCRIPTION

Also known as ‘acoustic barriers’, ‘noise barriers’ and ‘sound walls’. There are three types of noise walls to reduce traffic noise intensity (see *Noise Wall Types*):

- **Reflective Barriers** are located at the edge of the road and reflect traffic noise. Some noise passes over the barrier, but the noise level on the other side is generally low in relation to that on the traffic side of the barrier. The height of these barriers is typically greater than other types. Often, traffic noise levels increase for vehicle occupants.
- **Dispersive Barriers** deflect the majority of the traffic noise upwards or downwards by their inclination or by their surface pattern. Sometimes this type of barrier is considered as a variation of a reflective barrier.
- **Absorptive Barriers** absorb sound by forcing the sound pressure waves to move in and around many tiny fibres or passages to dissipate the sound energy. The facings on such barriers are normally proprietary materials. Generally, these barriers are not effective for very wide traffic easements.

A combination of barrier types may be required for particular sites and topographical conditions.

The benefits of using precast concrete as a noise wall include durability of material (a life expectancy of at least 50 years and more) and the variety of surface finishes available to suit the aesthetics of the site.

DESIGN CRITERIA

The main criteria for designers to consider are:

- Noise attenuation qualities (advice from acoustic consultant is recommend)
- Structural performance (generally, design for wind actions in accordance with AS/NZS 1170.2 requirements)
- Appearance of both faces of wall (see ‘Appearance’ below)
- Construction and life-cycle maintenance costs (including graffiti removal costs)
- Life of the barrier.

Noise walls of all three types can be supplied in precast units either as solid reinforced concrete panels or hollowcore prestressed panels, in a wide range of surface finishes. The minimum wall thickness is dependent on whether the wall is to be reflective or absorptive. Typically the minimum thickness for a precast concrete or hollowcore unit (used as a reflective barrier) is 125 and 150 mm respectively (see *Typical Details*).

APPEARANCE

Precast concrete noise walls offer the full range of surface finishes available to precast building facades. The following surface finishes are some that can be used:

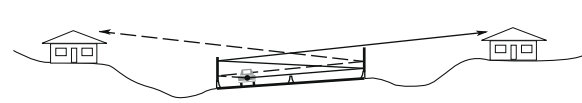
- Smooth off-form
- Painted off-form
- Water-washed exposed aggregate
- Acid-etched
- Sand-blasted exposed aggregate
- Patterned.

Refer to **Chapter 10 Architectural Elements** for full details of these and other types of surface finishes.

Hollowcore wall panels used as noise walls are available in the following finishes:

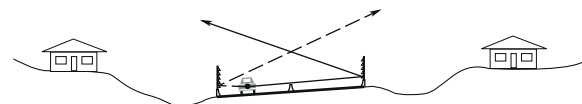
- Smooth
- Painted
- Water-washed natural exposed aggregates
- Coloured exposed aggregates and pigmented concrete.

NOISE WALL TYPES



Vehicle noise reflects back and forth between the barriers, eventually spilling over the top

Reflective Barrier



Dispersive barriers reflect most of the noise either upwards or downwards

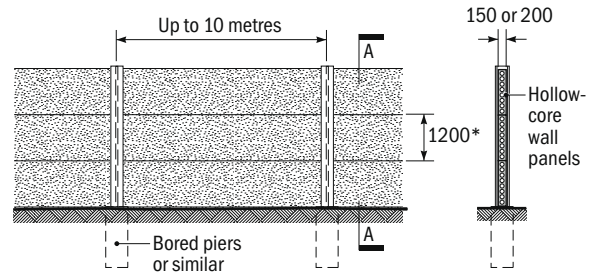
Dispersive Barrier



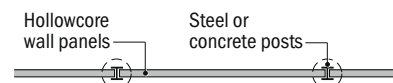
These barriers are designed to absorb most sound with only a small percentage being reflected

Absorptive Barrier

TYPICAL DETAILS



Elevation

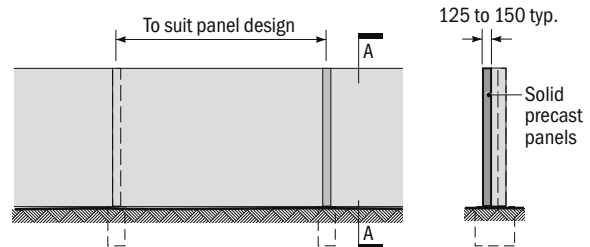


Plan

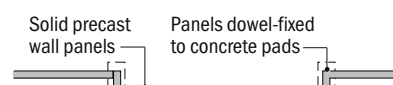
Section A-A

*May be cut longitudinally to produce narrower widths

USE OF HOLLOWCORE PANELS AS REFLECTIVE NOISE WALL



Elevation



Plan

Section A-A

NOTE: Many panel shapes and configurations possible, including footings

USE OF SOLID PRECAST PANELS AS REFLECTIVE NOISE WALL