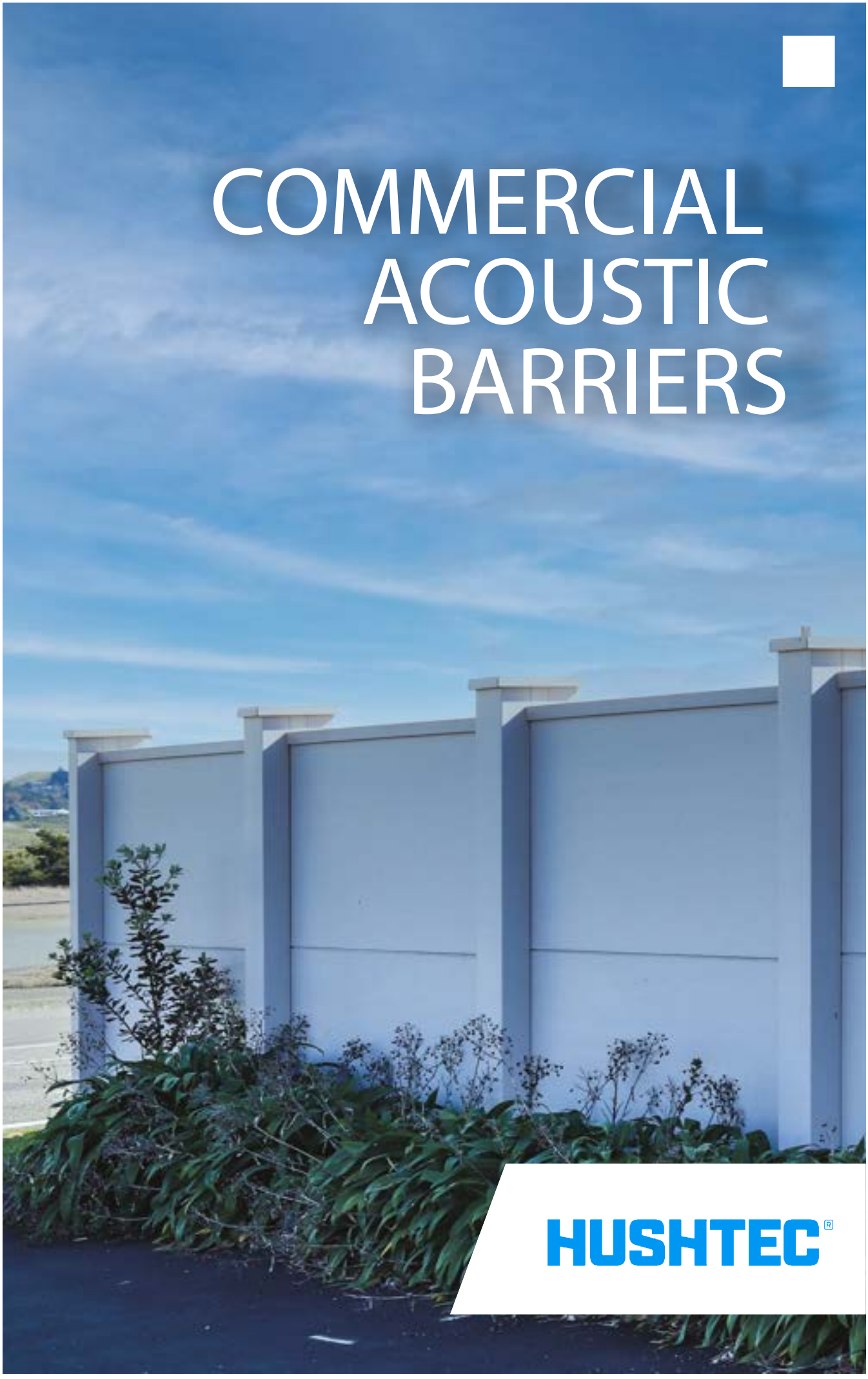
COMMERCIAL ACOUSTIC BARRIERS



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COMMERCIAL ACOUSTIC BARRIERS

HOW DOES A NOISE BARRIER WORK?

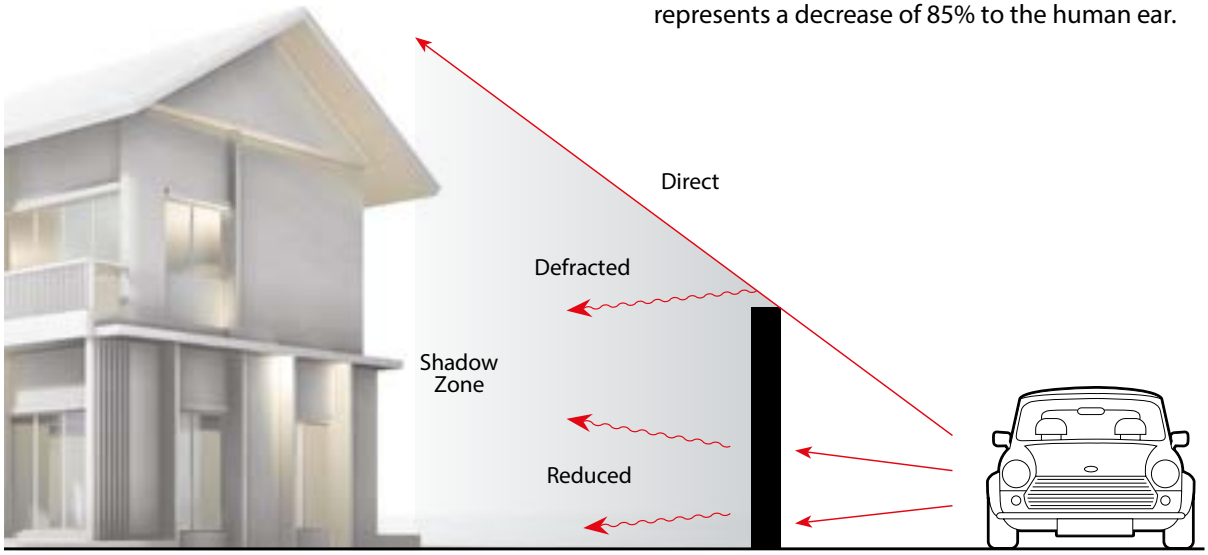
A noise barrier is a solid structure that intercepts and reduces sound within the shadow that it casts. The closer a barrier can be to the source or receiver and the higher it is, the more effective it will be, and, to be effective, the line of sight between the source and receiver must be blocked completely by the barrier.

The standard BelAire 70mm panel, with its 60mm expanded polystyrene core, will reduce sound levels up to approximately 28 decibels*.

*See "Acoustic Barrier Field Test". Levels in your own situation may differ due to environmental conditions such as ground type and surrounding objects or buildings. Frequency is also a factor – high frequency sounds are more effectively decreased than low frequencies.

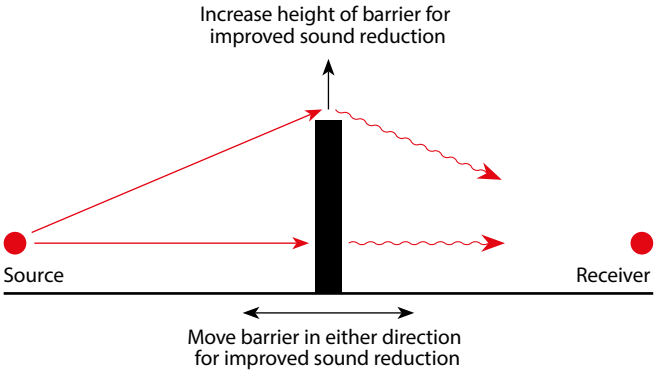
HUMAN PERCEPTION OF SOUND

DID YOU KNOW? A decrease in noise of 10dB would be perceived to be half as loud, and a 28dB reduction represents a decrease of 85% to the human ear.



COMMERCIAL ACOUSTIC BARRIERS

Decibels	Residential	Commercial
20dB	Whisper	Secluded Woods
45dB	Bedroom	Library
60dB	Conversation	Air Conditioning Unit
70dB	Living Room Music	Passing Cars
80dB	Factory Office	Passing Truck
90dB	Lawn Mower	Chainsaw
100dB	Motorbike	Jointer/Planer
110dB	Music Concert	Jack Hammer
120dB	Rock Concert	Jet Aircraft 150m away
140dB	Large Generator	Jet Aircraft 5m away



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ACOUSTIC FIELD TEST REPORT

Evaluated by the Acoustics Research Group at the University of Canterbury. A comprehensive report is available on request.

PURPOSE:

It is the intention of this report to illustrate the performance of the BelAire barrier system in real-world applications. These testing environments were selected due to their ability to offer easily identifiable and comparable scenarios. This included:

- Origin of sound, its type and extent
- Geographical layout
- Barrier configuration

SCOPE:

This information is to be used as a guide and in conjunction with the independent laboratory testing that has been performed on BelAire barriers. The test results reported below are an accurate account of the locations used. Should specific values be required for an application of the BelAire barrier system, it is recommended that a formal acoustic analysis be undertaken for that environment.

TESTING EQUIPMENT SPECIFICATIONS

Digitech model	QM-1589
Standard applied	IEC651 type 2, ANSI S1.4 type2
Frequency range	31.5Hz~8kHz
Measuring level range	30~130dB (Low range 30-100dB used for these records)
Frequency weighting	A/C (A used for these records)
Microphone	½" electret condenser
Time weighing	Fast 125mS, Slow 1 Sec (Slow used for these records)
Accuracy	+/-1.5dB

TEST 1 HIGHWAY ROAD NOISE

Origin source	6 lane highway (70Km/hr)
Location of barrier from origin	5.5m
Barrier type	4.0m barrier type wall (75mm panel)
Readings at exposed side	
Steady fluctuation	71-81dB
Peak reading	84dB
Minimum reading	68dB
Readings at shielded side	
Steady fluctuation	58-60dB
Peak reading	61dB
Minimum reading	56dB

NOTES:
Further readings were taken at a distance of 5m back from the shielded side of the barrier (approx 10.5m from origin). Readings at this distance displayed a fluctuating range of 1 to 2dB higher than at the shielded face of the barrier. Readings at greater distances from the shielded face displayed only ambient sound levels and were not influenced by the fluctuating decibel range of the highway.

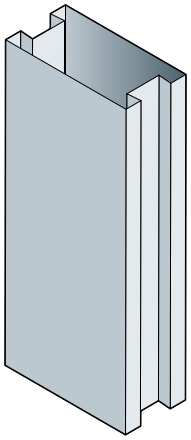
TEST 2 DOMESTIC LAWNMOWER

Origin source	2-Stroke lawnmower
Location of barrier from origin	2m
Barrier type	2.1m traditional type wall (75mm panel)
Readings at exposed side	
Steady fluctuation	90-91dB (min/max reading also)
Readings at shielded side	
Steady fluctuation	62dB (min/max reading also)

NOTES:
A secondary reading was taken at a distance of 5 meters back from the shielded side of the barrier and a steady reading of 63 dB was recorded. This increase of approx 1dB is consistent with the highway values shown in Test 1. The peak and minimum readings for the lawnmower test are not listed due to them being identical to the steady output values.

ACOUSTIC BARRIER POSTS

FOR BARRIERS up to 3.0m HIGH



Post dimensions: 140mm (deep) x 280mm (face) 0.95 mm BMT

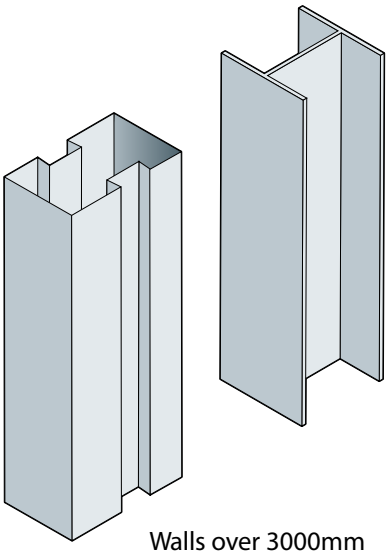
Panel thickness: 70mm

Density of composite panel materials: 15.49kg/m^2

Suitable for fence heights: 900mm – 3000mm

Post centres: 2630mm, 2930mm

FOR BARRIERS up to 3.1m – 5.1m HIGH



Post dimensions: 250mm (deep) x 150mm (face) 0.95 mm BMT

Panel thickness: 70mm

Density of composite panel materials: 15.49kg/m^2

Suitable for fence heights: 3000mm – 5100mm

Post centres: 2470mm

NOTE: All barriers over 3m high need to be engineered to suit the wind regions and the ground conditions. Please contact us on 0800 235 2473 for more details.

Walls over 3000mm high will likely need to use a 100UC14 Column.

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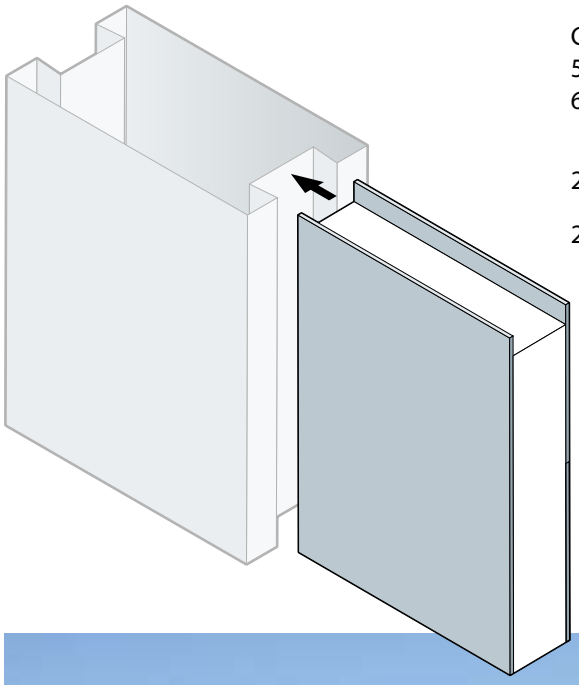
ACOUSTIC BARRIER PANELS



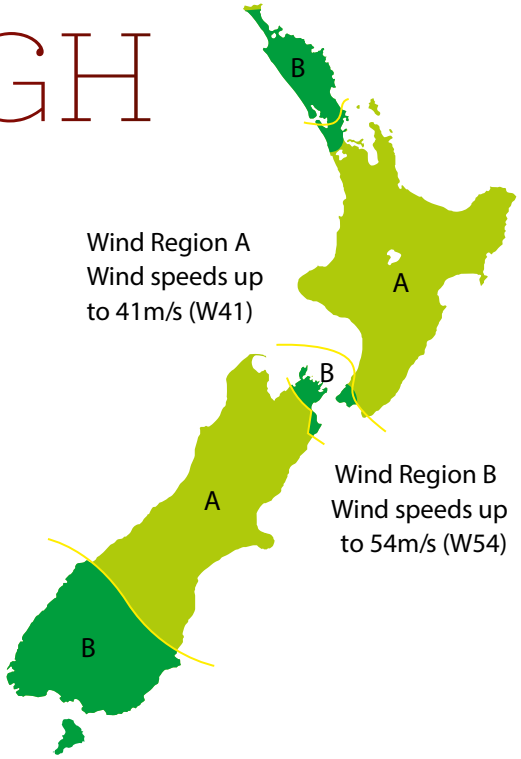
Construction:
5mm fibre cement outer skins
60mm expanded polystyrene core

2400mm (length) x 900mm (height) x 70mm (width)

2400mm (length) x 1200mm (height) x 70mm (width)

Up to 3.0m HIGH

SPECIFICATIONS



Wind Region A
Wind speeds up
to 41m/s (W41)

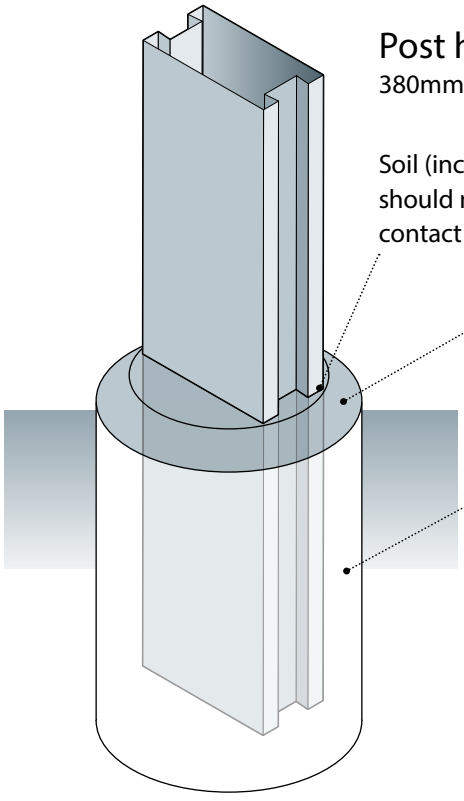
Wind Region B
Wind speeds up
to 54m/s (W54)

Centre to centre guide

Panel length		Post hole centres
2400mm	>	2630mm
2700mm	>	2930mm

Post hole depth guide Wind Regions A&B

Hole depth into firm earth or clay		Barrier height		Hole depth into sand, soft clay or loose earth
450mm	>	900mm	>	550mm
550mm	>	1200mm	>	650mm
600mm	>	1500mm	>	700mm
650mm	>	1800mm	>	800mm
700mm	>	2100mm	>	900mm
800mm	>	2400mm	>	1000mm
900mm	>	2700mm	>	1100mm
1000mm	>	3000mm	>	1200mm



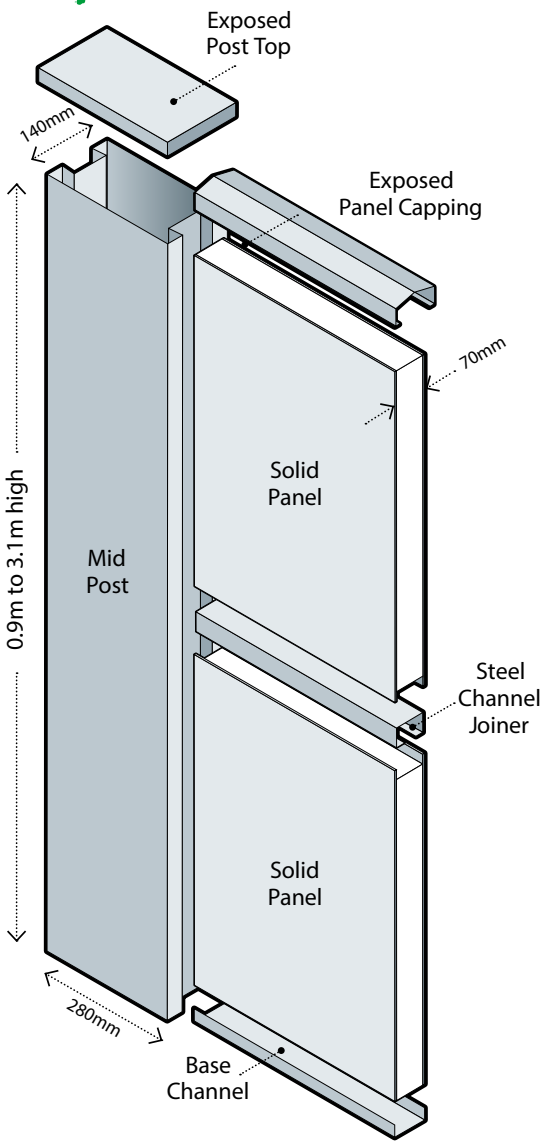
Post hole width:

380mm min (all wind regions)

Soil (including garden fill) should not be placed in contact with the steel post

Top of concrete should be sloped away from post for water drainage

Grade of concrete N20 with maximum size of aggregate 20mm. Concrete shall be compacted after placement inside footing hole.



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3.1m to 5.1m HIGH

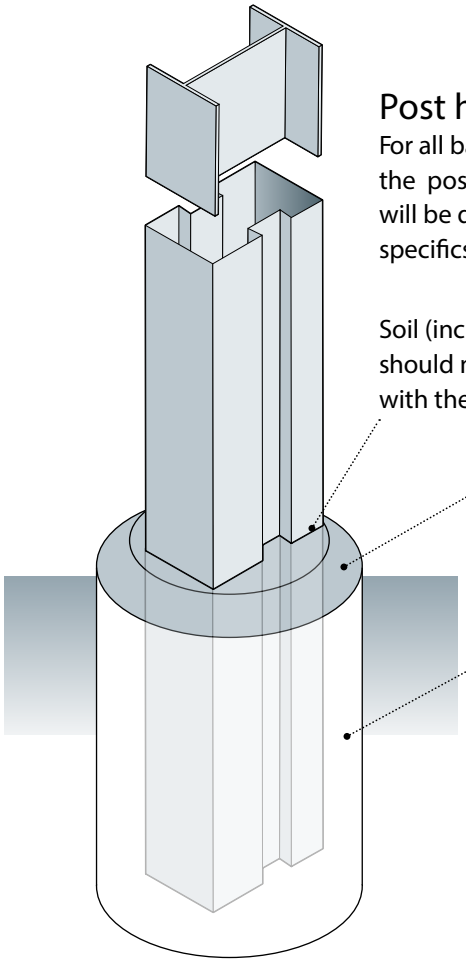
SPECIFICATIONS

Centre to centre guide

Panel length		Post hole centres
2400mm	>	2470mm

Post hole depth guide

Post hole depths and hole sizes will be determined by either the engineer or once on-site soil tests have been done.



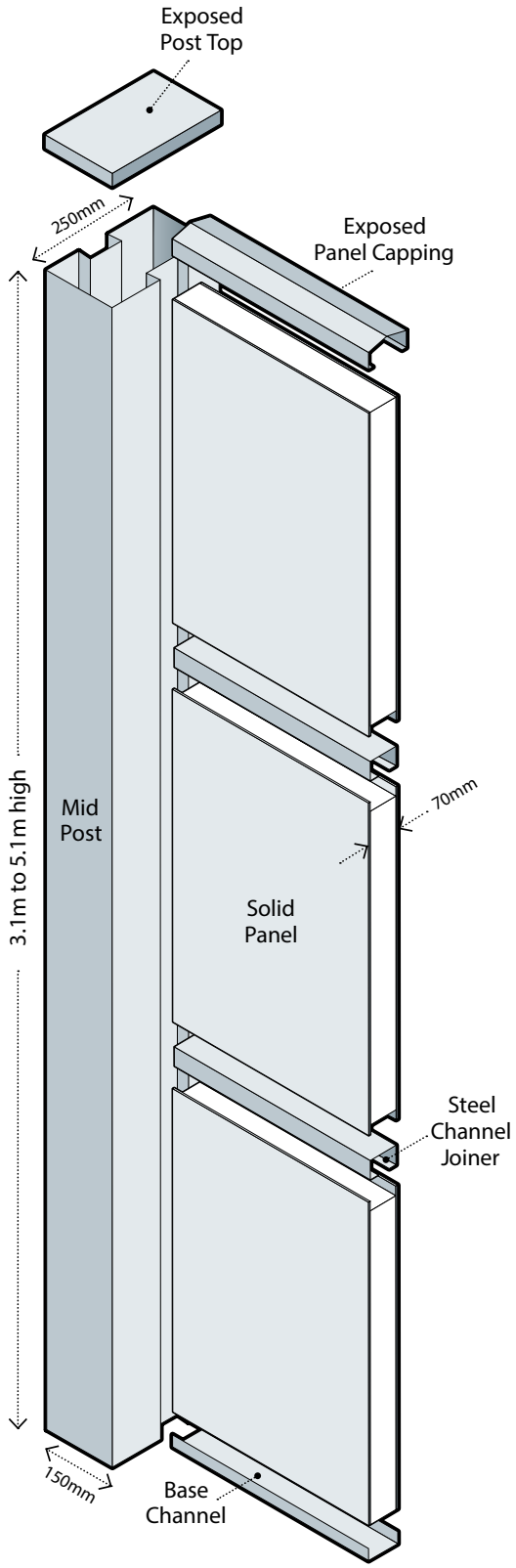
Post hole width:

For all barriers over 3.1m high, the post hole width and depth will be determined by the specifics of each site.

Soil (including garden fill) should not be placed in contact with the steel post

Top of concrete should be sloped away from post for water drainage

Grade of concrete N20 with maximum size of aggregate 20mm. Concrete shall be compacted after placement inside footing hole.



Early Education Centre

An early education centre in one of Hamilton's fast-developing subdivision were looking for a wall which provided them with maximum security and noise reduction. BelAire Fencing customised a 200m Classic wall with a fun and playful colour combination.

Project Specifications:

Client: Rob Berridge Fencing

Classic Acoustic Wall
200m x 1.5/1.8m high

Flush Capping, Solid Wall
The 1500mm and 1800mm high solid panel acoustic wall was made a feature by alternating the 900mm and 600mm solid panels to make a feature out of the paint combinations.

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Parkland Subdivision Napier

The Napier Council required a noise attenuation and security wall for it's subdivision in Parklands. The project was bordering the expressway so noise reduction was an important feature. In 15 days we were able to construct 1500m of 1.8m high barrier wall.

Project Specifications:

Signature Acoustic Wall
1500m x 1.8m high

Exposed Capping, Solid Wall
1800mm high Solid acoustic wall

"We were all very happy with the work carried **out. Everything was done in a very efficient** and professional manner and the guys are a great team to work with. Thanks again."
Napier Council

Queen Street Cycleway

The cycleway in Auckland had to have a noise wall as part of the entrance onto Queen Street. BelAire delivered exactly what was required and could reduce the required amount of noise as specified, with the 4.1mtr high wall this was the perfect solution to satisfy acoustic engineers requirements.

Project Specifications:

Signature Acoustic Wall
25mtr x 4.1m high

Exposed Capping, Solid Wall
The 1800mm high Solid acoustic wall used 100uc14
Beams for the posts at 2200mm post centers.

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Horse Training Facility

Noise wall was required for around the residence of the stables and training facility in Cambridge. BelAire were able to supply, install and deliver exactly what the client was looking for to reduce noise from both the highway and also the horse training facility.

Project Specifications:

Client: Rogerson Stables

Signature Acoustic Wall
150m x 2.7m high

Exposed Capping, Solid Wall
The 2700mm high solid panel acoustic wall was made up of 3 x 900mm high solid panels. The terrain we could facilitate by cutting the bottom panels on an angle to suit the slope. The client also required a solid sliding gate for the driveway and a solid hinged pedestrian gate. Complete project was delivered in full and on time with minimal site disruption.


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