

INT&RIOR SYSTEMS

Guiding Design • Informed Interiors

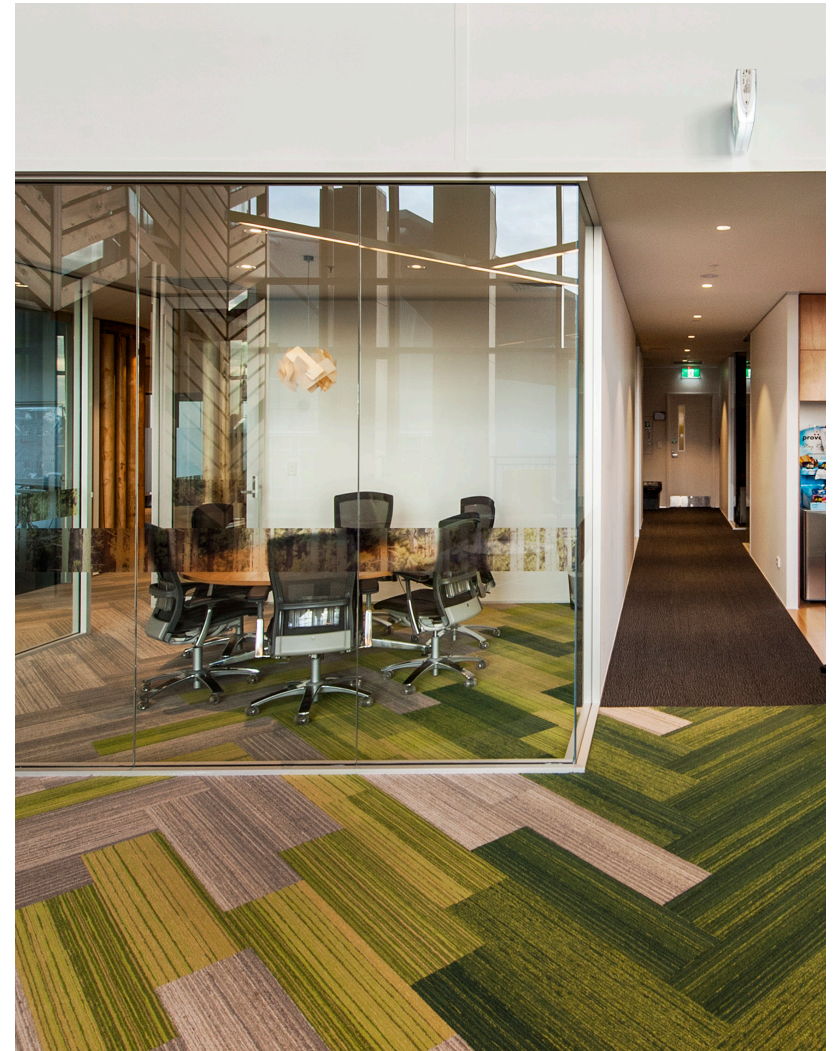
ECLIPSE ALUMINIUM SUITE

This eBook

This eBook covers the use of aluminium partitioning in Commercial interiors and discusses its environmental implications, specifically related to its use in New Zealand and the smelter at Tiwai Point.

Furthermore, we will look at the various options that an Aluminium Suite offers the designer, from specialised smoke-stop and acoustic partitions, to different depths and chunkiness of aluminium.

Check out: www.tris.co.nz



64mm Eclipse Aluminium installed
at Rayonier Offices.



Eclipse Aluminium Suite installed
in Whanganui City Council.

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Maori TV Buildings, RCG Limited
120mm Swung Door, 92mm Sulte

PARTITION WALL: Non-load bearing walls that separate spaces in buildings. As well as spatial division, they can provide; privacy, acoustic and smoke separation.

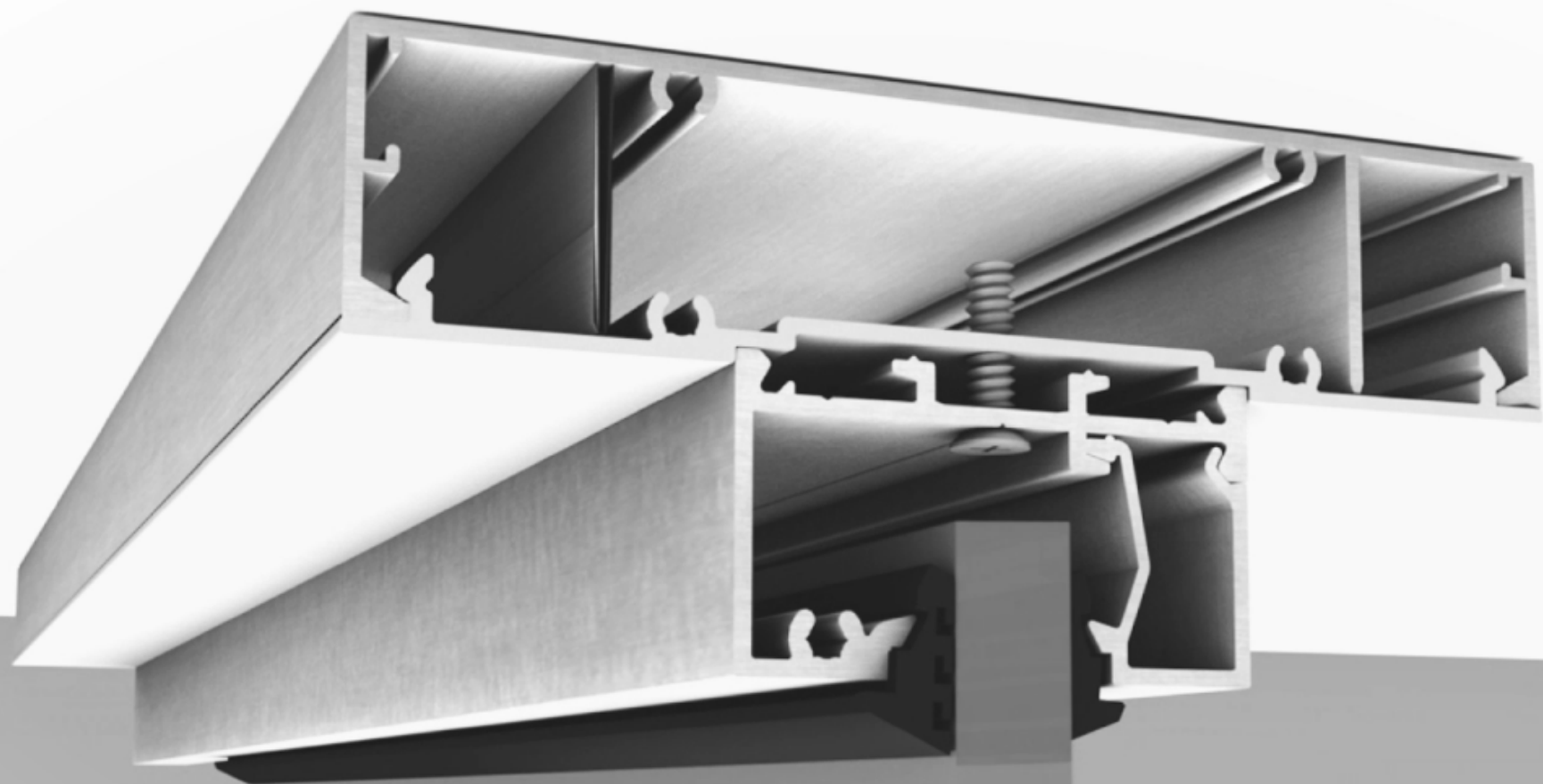
INTRODUCTION

A partition is a wall that divides a large area into smaller separate spaces typically using glass or plasterboard linings.

Partition walls are constructed, doors and services fitted as required, as part of commercial or industrial building fitouts. Typically, it is not a design strategy for the partition walls to carry structural loads and often the partition walls terminate at the suspended ceiling, or just above.

The most common types of partition walls use either framed glass, or steel studs with plasterboard as a lining. In the case of glass it becomes an integral element of the wall structure.

An Aluminium Suite is relatively simple to construct and allows glass and plasterboard partitions to work seamlessly together. The way to think of Aluminium partitioning is as a giant Meccano or Lego set, where pieces lock together in a myriad of different ways to form a broad range of potential details. In saying that, most of the time, it's used to create glass walls around meeting rooms, or construct semi-glazed glass partitions to define an area, and the details are relatively standard.



4T = 2T = 1T
BAUXITE ALUMINA ALUMINIUM



ALUMINIUM OVERVIEW

Aluminium is made from Bauxite which is common in the Earth's Crust. Our Bauxite is mainly mined in Australia.

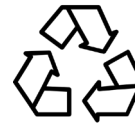
Bauxite is the most common metallic mineral found in the earth's crust accounting for seven percent of its mineral makeup. The current estimates of reserves of bauxite using today's consumption rate are estimated to be several hundreds of years of global reserves. Furthermore it is infinitely recyclable.

At New Zealand Aluminium Smelters at Tiwai Point, Aluminium is commercially smelted from bauxite predominately using the Hall-Héroult and Bayer process. This process is accomplished in two phases: the Bayer process refines the bauxite ore to obtain aluminum oxide, and the Hall-Héroult process smelts the aluminum oxide to release pure aluminum.

Key supplier for T&R's Eclipse aluminium partitioning Suite is NZ Aluminium Smelters. They supply INEX who extrudes our Aluminum Suite.



BAUXITE MAKES UP **7%**
OF THE EARTH'S CRUST



INFINITELY RECYCLABLE
REDUCING LANDFILL BY
5-8% PER YEAR



RAW BAUXITE



Ti Wai Point.

TIWAI POINT

ALUMINIUM SMELTER, BLUFF



We can't ignore that much of the environmental impact of extruded aluminium products comes from upstream. Approximately 85% of the billet for extrusion in the Waikato region is made in New Zealand at New Zealand Aluminium Smelters (NZAS) at Tiwai Point in Bluff. The smelter produces the world's purest aluminium—99.98% pure— and is one of only two smelters in the world producing ultrahigh purity aluminium.

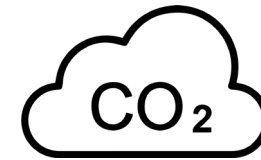
NZAS conducts an extensive on-site monitoring programme to assess its effects on the environment. In addition, specialist consultants have conducted studies on specific aspects of the environment.

The environmental monitoring data is regularly reported to Environment Southland and is reviewed by other regulatory agencies at the Interdepartmental Committee, which meets annually. Rio Tinto has committed \$NZ4 million towards the removal of all aluminium dross and ouvea premix.

EMISSIONS

Aluminium manufactured at Tiwai Point has carbon emissions well below 4 tonnes CO₂e/t per tonne of aluminium, primarily due to the use of hydroelectricity in production.

For context, the world average CO₂ emissions for aluminium billet is approximately 17.5 t CO₂e/t, and the average for China is over 20 t CO₂e/t. This means that the aluminium from Tiwai Point produces 75% less emissions than the world average. An added benefit is that the carbon impacts from international shipping are removed when this product is manufactured locally.



TIWAI POINT PRODUCES
75% LESS EMISSIONS
THAN THE WORLD AVERAGE



99%

OF ALUMINIUM SCRAP
FROM PRODUCTION IS
RECYCLED

“**RECYCLING IS AN
ESSENTIAL PART OF THE
ALUMINIUM INDUSTRY
AND MAKES GOOD
SENSE ECONOMICALLY,
TECHNICALLY, AND
ECOLOGICALLY.**”

‘Aluminium Extrusion and Sustainability’, Inex.

Unlike timber, plastic, ceramics, fibrous plaster and many other building products, aluminium can be recycled indefinitely due to its high intrinsic value. Aluminium is also the most cost-effective metal or material to be recycled thus reducing landfill by 5-8% every year.

Our aluminium extrusions are made of virgin aluminium, mostly to ensure consistency of colour through the anodising process. However, the suite itself is fully recyclable after use and will go on to be extruded into construction products where colour is less critical.

Aluminium has been recycled since it was first commercially produced and today recycled aluminium accounts for one-third of global consumption. Recycling is an essential part of the aluminium industry and makes good sense economically, technically, and ecologically. All aluminium products retain value, even at the end of their useful life, which guarantees that it is possible to continue to create value by recycling them into new products. Recycling 1kg of aluminium saves up to 6kgs of bauxite, 4kgs of chemical products and 14kWh of electricity.

INEX recycles approximately 99% of aluminium scrap from production, the only NZ company that has this relationship with Tiwai Point. The majority of this is recycled in New Zealand. Furthermore, over 70% by weight of all waste streams from the industry is recycled. Steel used for dies manufactured locally contains 40% recycled content, and all offcuts are recycled, as well as the dies themselves at end of life.





DIE PROCESS

After it's turned into Billet, the aluminium is shipped out to Manufacturers. Here the aluminium is heated again to about 500°C and pushed through precut dies, as it exits the press it comes out at 525°C. Every extrusion requires its own die. A die weighs somewhere between 100-200kgs each.

Every die is drawn up and tested through 3D print before being committed to a die.



IT TAKES 100,000-125,000 PSI
OF FORCE TO PUSH A BILLET
THROUGH AN 8 INCH PRESS

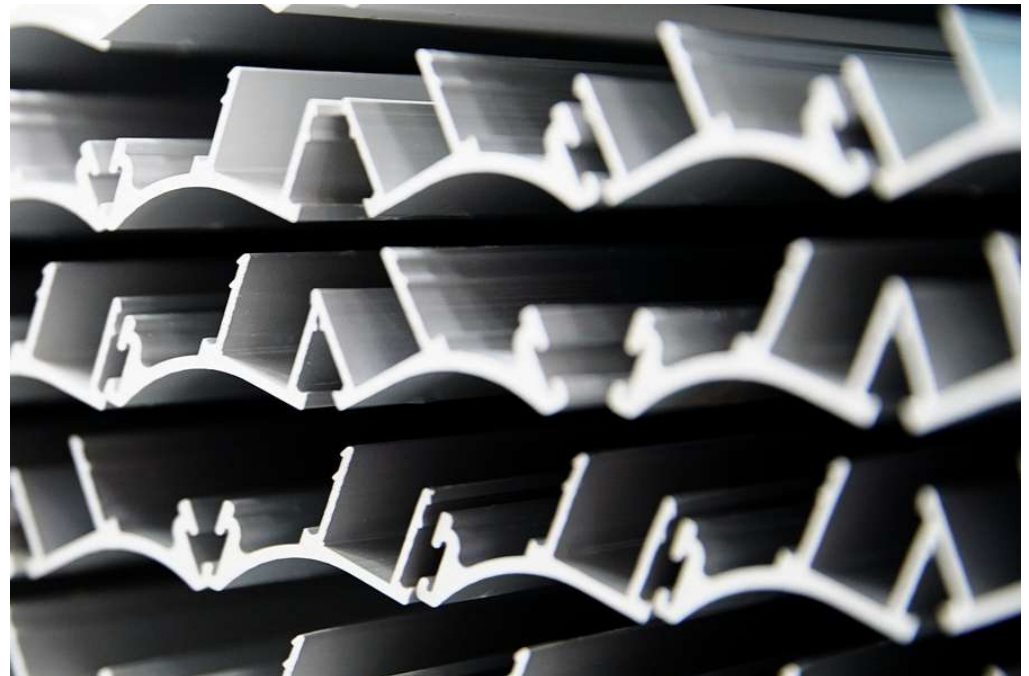


Catalyst Offices, Auckland
64mm Suite.

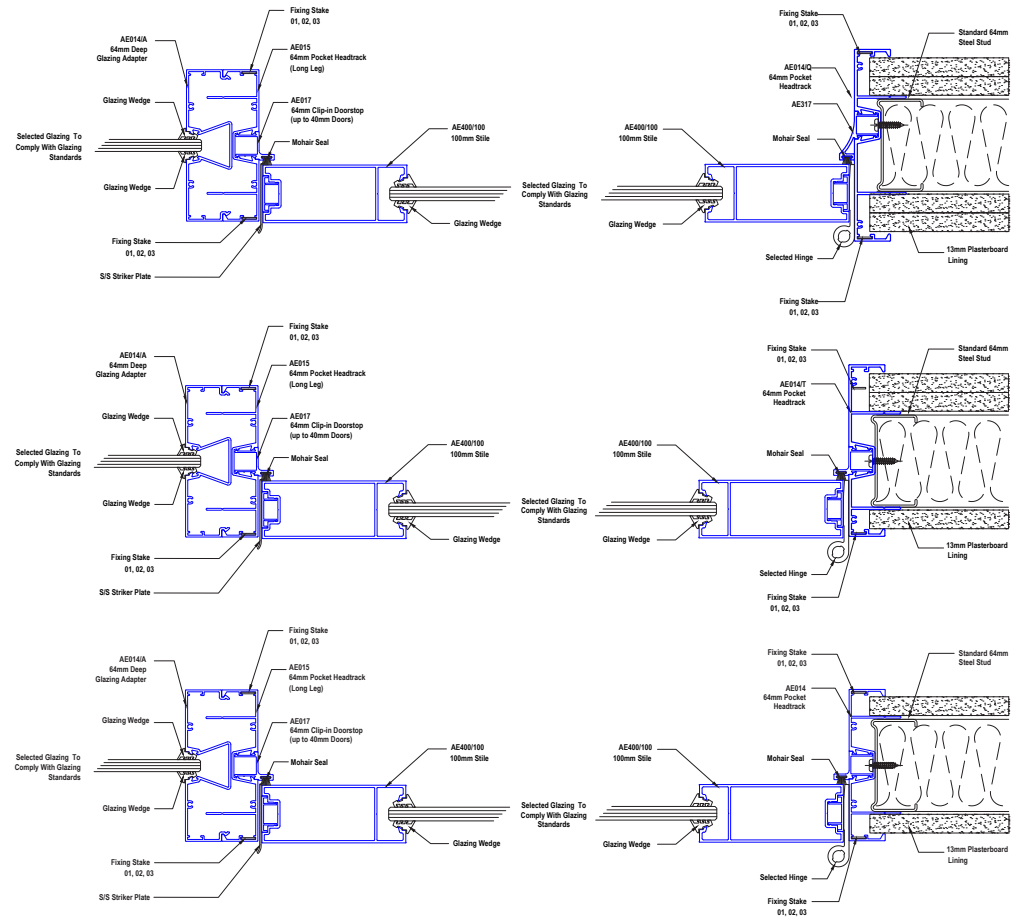
T&R ECLIPSE

T&R have an Aluminium Suite called Eclipse. Our extrusion supplier is based in Hamilton and uses primarily NZ-made billet, NZ-manufactured dies and the Eclipse Suite has been designed by various team members at T&R, making it a truly New Zealand Made product. The Waikato aluminium extrusion industry is a crucial supplier to almost all residential and commercial buildings in New Zealand.

INEX is an independently owned NZ company, supporting NZ business. 70% of New Zealand aluminium for doors, partitions and windows comes from INEX.



SPECIFICATION

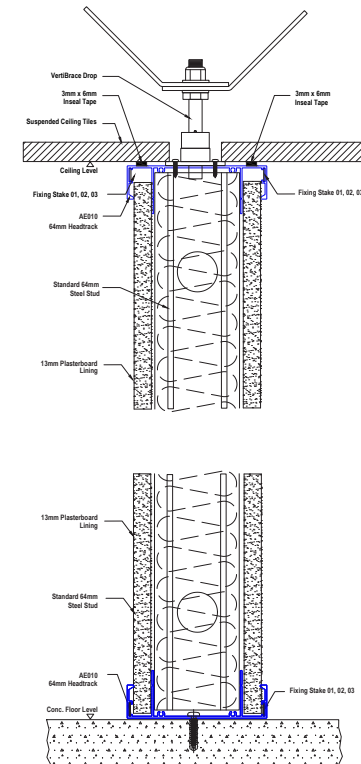


SPECIFYING ECLIPSE

When specifying partitions, several performance characteristics are normally used to determine the required solution, but the decisions are largely based on aesthetic requirements for each individual project.

Process

- 45mm, 64mm, 92mm Suite
- Visual look (thin vs chunkiness)
- Functionality
- Specialist coatings: Powdercoating colours, metwood colours
- Antibacterial coating
- All drawings available for specification drawings, if any are missing, we can create them





45mm



64mm

Frontline and Double Glazing
available



92mm

Frontline and Double Glazing
available

THE RANGE

*Mercedes Benz, Auckland
Eclipse Aluminium Baffle
and Eclipse Suite.*



The Eclipse Suite is available in 45mm slimline, 64mm and 92mm options, depending on design requirements. There is also an option of an ultra slim glazing frame for a minimalist look.

The suites have a clean 'Frontline' version where the glazing sits at the front of the bar and the 64mm and 92mm suites have the option of double glazing.

Depending on the project or construction type, performance parameters may be set by minimum regulatory standards, or the client's requirements for certain standards of performance and comfort.

One of the main considerations is always acoustic performance. Many clients want good performance when it comes to acoustic sound separation. With the on-going requirements for predominantly open plan office space, there is a need for quiet offices and meeting rooms where confidential conversations can take place. Consequently, the acoustic performance of glass partitions has become increasingly important.

STC

Sound Transmission Class (STC) is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings and floors, doors, windows and exterior wall configurations (see ASTM International Classification E413 and E90).

In short, STC gives you a rough idea of how much sound energy a partition wall for example, might stop. STC is the most common sound reduction measurement in use. (As common as this measurement is, it is quite limited and should not be totally relied upon for real-world soundproofing expectations.)

LEVEL	RESULT
30+ STC	Loud speech can be understood fairly well. Normal speech cannot be easily understood.
40+ STC	Loud speech can be heard, but is hardly intelligible. Normal speech can be heard only faintly, if at all.
46+ STC	Loud speech can be faintly heard but not understood. Normal speech is inaudible.
50+ STC	Loud speech cannot be heard through the wall.
60+ STC	Very loud sounds (such as loud singing, brass musical instruments or radio at full volume) can be faintly heard. Complete privacy.
65+ STC	Blocks most noise.

PRIVACY

Without proper consideration, glazed partitions and doors can cause serious acoustic weaknesses in a partition system.

An internal working environment with comfortable or low levels of noise helps employees concentrate, focus and provides a healthy working environment. Certain interior areas and rooms used to discuss confidential matters may require glass partitions with increased levels of sound attenuation to ensure privacy.

Installing laminated acoustic glass panels or a double-glazed partitioning system will improve sound attenuation between adjoining rooms and spaces. But the effectiveness of such systems is limited by the gaps around doors, seals, flanking paths, aluminium weakness etc. Where a high level of privacy is required, specialist input should be sought.

GLASS DESCRIPTION	RESULT
10mm Toughened, 50mm air space, 10.38 PVB Laminate	43 STC
10.38mm PVB Laminate, 50mm air space, 11.52mm Antibandit	46 STC
10mm Toughened, 50mm air space, 10.76 PVBA Laminate	47 STC
10.76 PVBA Laminate, 50mm air space, 10.38mm PVB Laminate	47 STC
10.76mm PVB Laminate, 50mm air space, 11.52 Antibandit	48 STC



Rayonier Offices
64mm Suite

FURTHER ACOUSTIC CONSIDERATIONS

Layout:

Placement of adjacent spaces, doors and various activities can have a great effect on the amount of acoustic annoyance caused by low STC partitions. Ideally, identify critical spaces during the design phase and ensure those are designed properly.

Parallel flutter and absorption:

The rooms created will need acoustic treatment to ensure they don't have an excess of reflective surfaces. These cause unwanted reflections, high reverberation times and will play havoc with microphones!

ECLIPSE DOORS

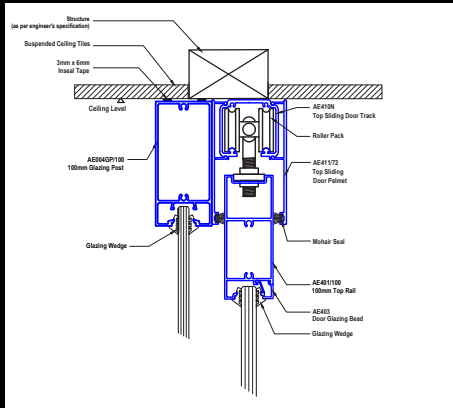
The Eclipse Suite also has a comprehensive door suite which allows for top hung, bottom rolled, swung and bi-fold door options that integrate with glazing and plasterboard sections.

These door frames are available with 80mm, 100mm and 120mm stiles. Apart from some hardware restrictions, it is again up to personal preference what size to specify.

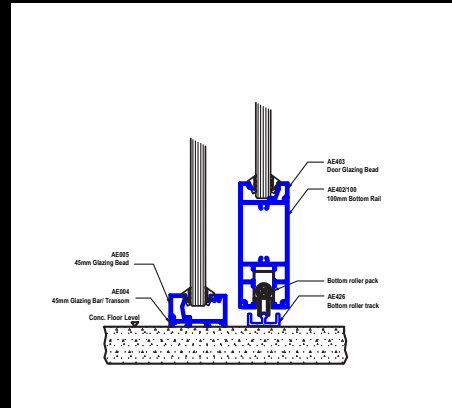
The Eclipse Suite also has specialised doors for Smoke Control and Acoustic requirements.



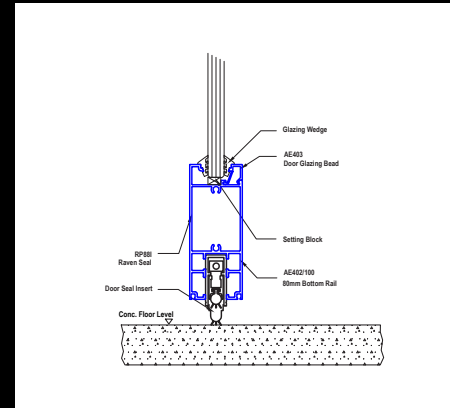
*Big Blue
64mm Suite, 100mm Bi-Fold Door.*



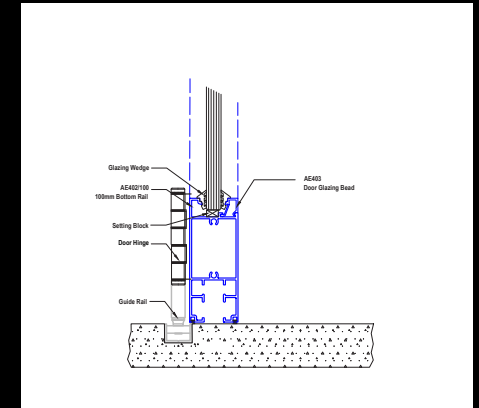
Top Hung Door
80, 100 and 120mm



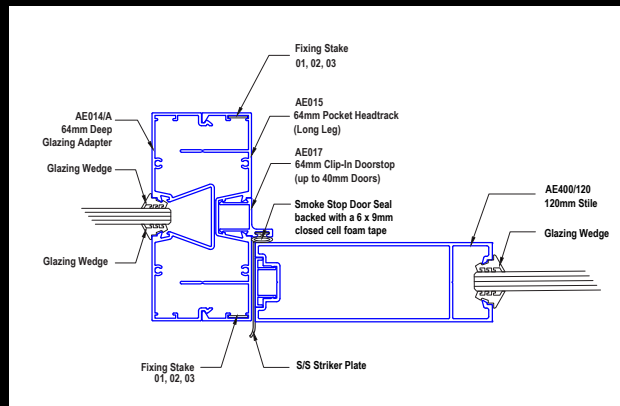
Bottom Rolled Door
80, 100 and 120mm



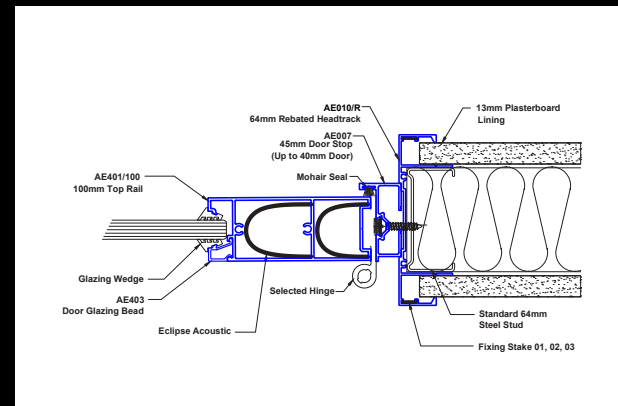
Swung Door
80, 100 and 120mm



Bi-Fold Door
80, 100 and 120mm



Smoke Stop Door
120mm



Acoustic Door
80, 100 and 120mm

ACOUSTIC DOORS

T&R has physically tested our glazed partitions and glass doors' acoustic performance. This means that test data is based on real performance rather than predicted figures based only on glass attenuation performance.

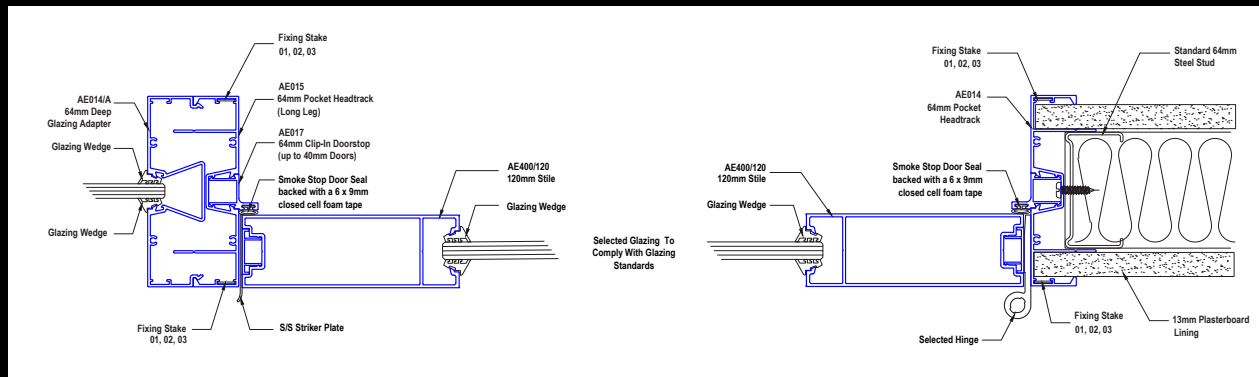
Unless the aluminium extrusions are specifically treated it always acts as a weakness in an overall system, making the whole system less effective. Our testing has shown that adding a flexible acoustic barrier into the extrusion mitigates this weakness and brings the aluminium framing performance up to the level of the glass.

Double glazing options have also been tested and show it is possible to achieve STC48.



SMOKE STOP DOOR

ACHIEVES -/-/-SM RATING



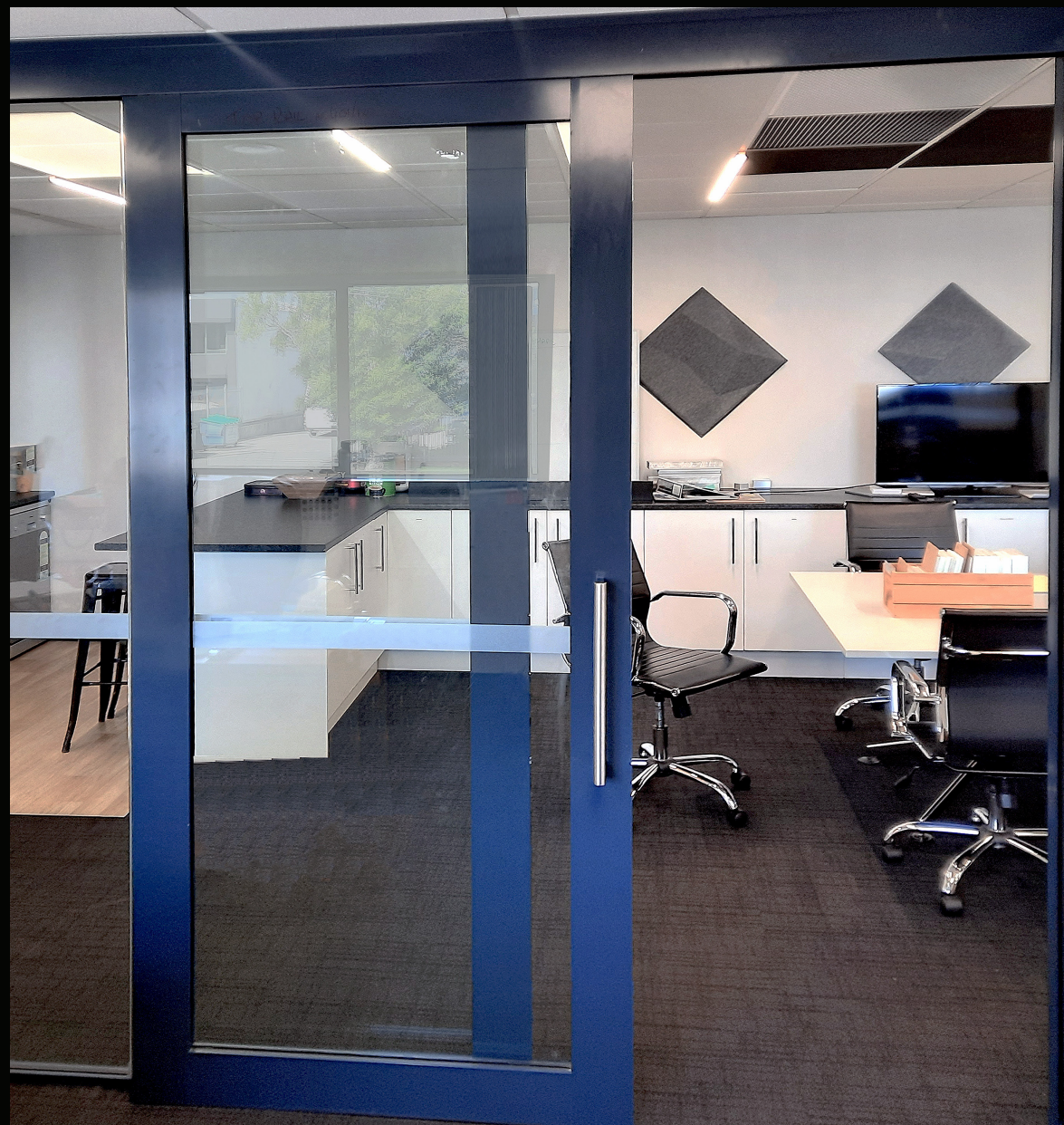
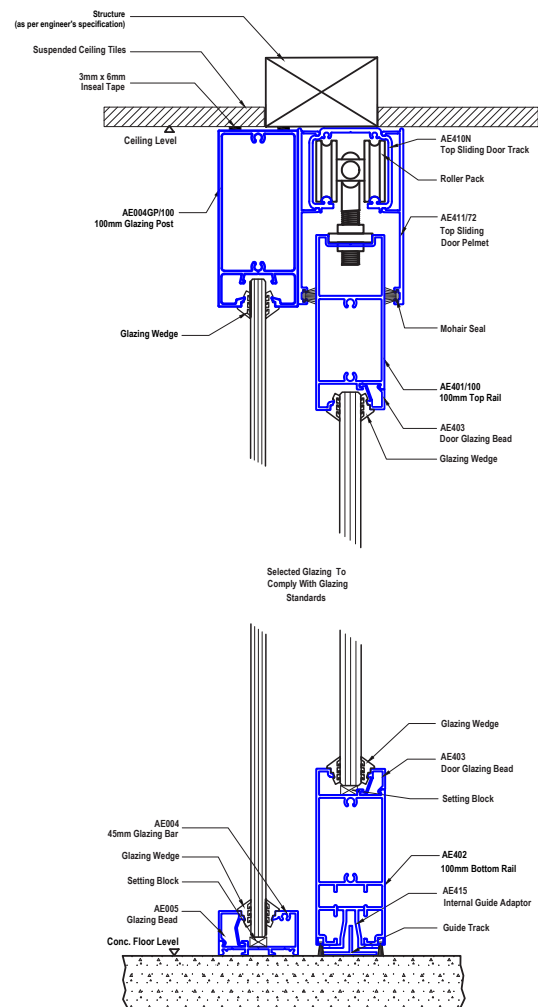
Only Aluminium Glazed door to comply with NZBC.



Ecoefficient Office, Designco Group Limited
Smoke Stop Door.



Above Your Space - Billens
64mm Suite with 100mm Bottom Rolled Door





Big Blue
64mm Suite, 100mm Bi-Fold Door.

SEISMIC CONSIDERATIONS



AS/NZS 1170.0 requires buildings to be designed and constructed so that during their design working life, they are able to withstand all actions and environmental influences that may be imposed on them.

Section 3 of AS/NZS 1170.0 requires that

buildings must be able to withstand seismic actions so that:

- the building does not collapse
- parts of the building do not collapse if they present a hazard to people inside the building
- the non-structural systems (such as suspended ceilings and partition walls) that will enable people to evacuate the building do not collapse.

Building movement caused by dead/live loading, wind and seismic events can produce pressure and stress on interior partition walls. This pressure can cause walls and glazing units to be crushed, broken, or torn. Standard rigid bracing does not accommodate vertical displacement (when designed for, it's usually mitigated with deflection headtrack). Instead of using deflection headtrack, VertiBrace allows for this movement through a sliding connection.

The VertiBrace has been developed to exceed the New Zealand Building Code using sound engineering principles. The performance and capacity of all brackets has been quantified by extensive physical testing.





ANY QUESTIONS?

Please do not hesitate to contact our knowledgeable team members with any questions you may have regarding our Eclipse Aluminium Suite.



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