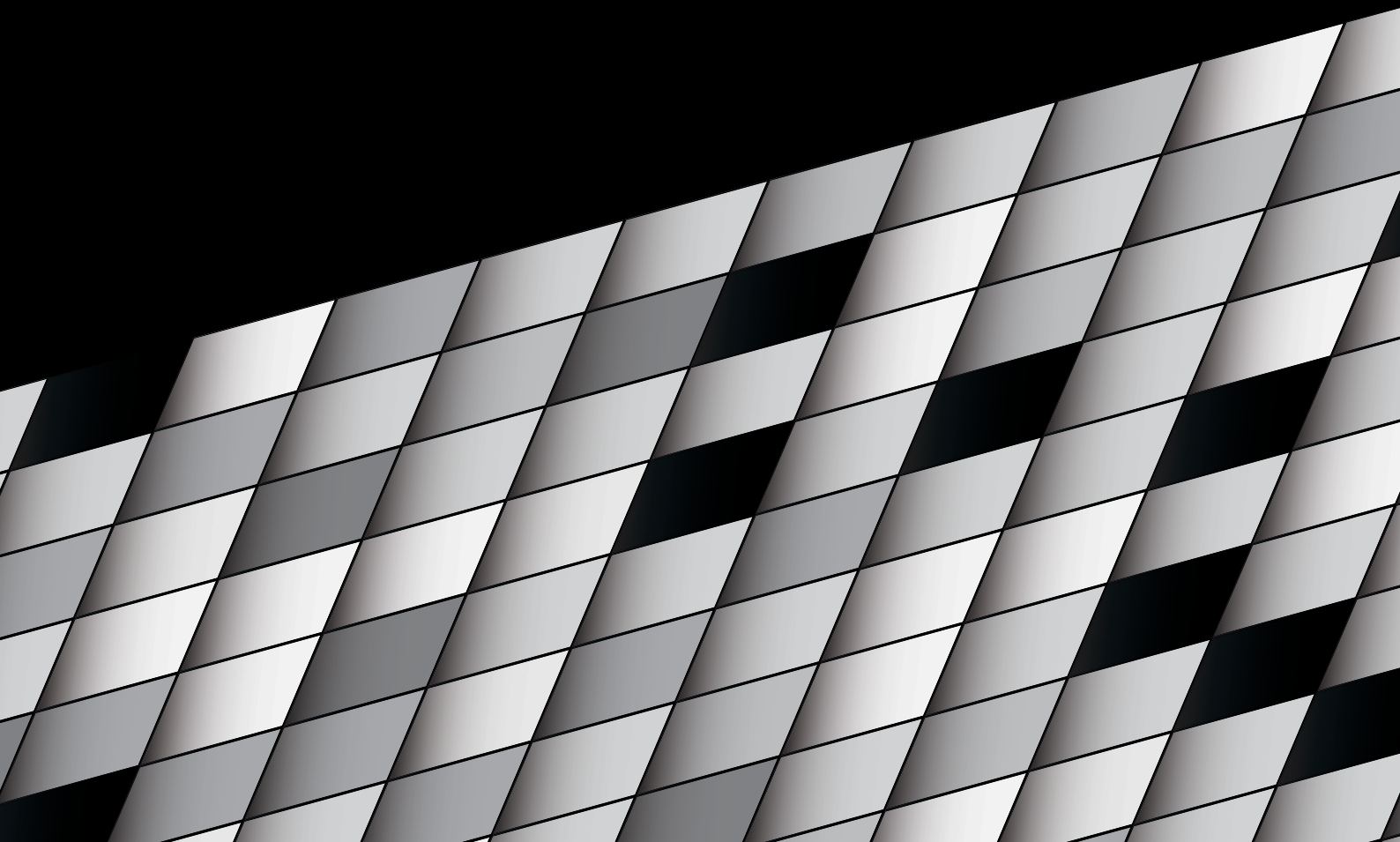


TECHNICAL MANUAL

Durra Panel
Durra Steel Sections
Panelised Building Systems

MADE IN AUSTRALIA



Durra Panel, Durra Steel Sections, Durra Panelised Building Systems

Ortech Industries, an Australian owned company incorporated in 1985, manufactures Durra Panel, Durra Steel Sections and Durra Panelised Building Systems at its production facility located in Bendigo Victoria.

Durra Panel is a unique rigid building product that combines the desirable properties of low embodied energy, strength, acoustic and thermal insulation together with a high degree of impact and fire resistance.

Durra Panel combines the desirable properties of low embodied energy, strength, impact resistance, thermal and acoustic insulation together with a high degree of fire resistance.

Manufactured using innovative Australian developed technology, Durra Panel is produced using a unique dry extrusion process that converts a natural and renewable resource; wheat or rice straw fibres (biomass) into durable construction panels. The low energy manufacturing process requires no water or gas and is completely free of chemical additives, or binding agents. The result is an economical multi use construction material that is 100% biodegradable at the end of its useful life - an environmentally preferable product, with a proven track record over 50 years throughout Australia and internationally.

Durra Panel and Durra Steel Sections may be used separately as general purpose construction materials or be combined together

to form a wide range of panelised roof, ceiling, wall and flooring systems – commercial, industrial and residential applications.

A corner stone objective of our business is to satisfy the ever growing need for innovative techniques combined with modular solutions and pre fabrication – Design for Manufacture and Assembly (DfMA) methodology.

Ortech Industries uses engineered precision processes to manufacture Durra Panel and Durra Steel Sections in a safe and controlled off site factory environment in accordance with project supplied specifications and shop drawings. The pre-cut, marked and packaged components are then sent to site ready for safe, no waste ground based assembly into large panelised roof, ceiling and wall modules that are installed using the Durra Lifting Frame.

Ortech Industries also builds Durra Panel Machinery and can provide Licensing Agreements for the Durra Panel manufacturing and building systems technology into other countries that have a plentiful supply of wheat or rice straw fibre. The success of Durra Panel; and Durra Building Systems is the result of over 50 years of product testing, development and innovation.

The following pages include technical literature and recommended applications for our building products and building systems. Should you require any further information please contact Ortech Industries, we would be pleased to assist.

Derek Layfield
Managing Director, Ortech Industries



Contents

Each section of this manual covers in details all the relevant technical data applicable to each of our company's products and systems.

The Technical sheets have been allocated reference numbers rather than page numbers. This will enable amendments and additions to be made when new information becomes available.

An index to each section is included, detailing the current list of reference sheets and this will act as your guide to ensure that all sheets are included in your manual. Refer to Ortech Manual Revision Table.

Manual Revisions

As new 'technical' and 'updated index' sheets become available, they will be circulated to all manual owners.

Although every endeavour will be made by our representatives to keep your manual current, there will obviously be occasions where some manuals will be missed – it is, therefore, our recommendation that periodically you make contact with Ortech Industries to ensure that your manual is kept up-to-date.

Reference should be made to the 'issue' or 'last revision date' as noted below.

Original Date of Issue: 20/02/2014

Note: Refer to Ortech Technical Manual Revision Table for revision reference pages.

Technical Manual Revision Number	
Date	Revision Number
22/09/14	1
19/03/15	2
15/03/16	3
28/06/17	4

Voiding of Ortech's Product Warranty

Ortech products are designed and manufactured to be used as part of Ortech's complete building system. Subject to any applicable laws, the Product Warranty for Ortech products will be voided if Ortech products are used together with third party products, parts and/or accessories which do not form part of, or are not expressly approved by Ortech for use with, Ortech's complete building system. For further details on Ortech's Product Warranty, please refer to the Product Warranty document provided with Ortech's products.



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NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Ortech Technical Manual Revision Table

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Section 1

Durra Panel

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NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Introduction



RAW MATERIAL



CROSS SECTION - S50 DURRA PANEL

DURRA PANEL is a unique rigid building slab designed for use in roof, ceiling and wall applications. Durra Panel combines the desirable properties of; strength, impact resistance, thermal and acoustic insulation together with a high degree of fire resistance.

Durra Panel is low in embodied energy and contains no additive chemical binders; an environmentally preferable product with a proven track record over 50 years, throughout Australia and around the world.

Raw Materials

Durra Panel is manufactured in Bendigo, Victoria from locally sourced raw materials that are 100% biodegradable;

- Wheat straw fibres (biomass)
- Kraft liner

Manufacturing Process

Durra Panel is manufactured in Australia under patent Nos. 273872 and 277845 by Ortech Industries at Bendigo, Victoria. Durra Panel is produced through a unique dry extrusion process that converts a natural annual renewable resource; wheat or rice straw fibre into a multipurpose construction panel. Under extreme heat and pressure, the straw fibres release a natural polymer; lignin, that is used to fuse the panel core. A high wet strength recycled Kraft liner is laminated to the panel core with a PVA glue line to complete the process.

An innovative manufacturing technology that uses no water or additive chemical binders, and produces only biodegradeable waste (compressed straw). One tonne of wheat or rice straw fibre will yield approximately 50m² of S50 Durra Panel – a significant sustainable product.

Panel Dimensions

Durra Panels have square edges and are provided in two thicknesses; S50 (nominal 50mm thick) and S58 (nominal 58mm thick).

Durra Panel is dimensionally stable. The standard panel width is 1187mm to fit the 1200mm Durra Steel Sections wall and roof / ceiling grid. Panel length is variable (as an extruded product) up to a recommended maximum of 3600mm. See Ref 1.3.4 Specification.

Applications

Durra Panel may be used on its own for acoustic walls and ceilings or be combined with Durra Steel Sections (roof purlins, roof rafters, wall girts and floor joists) to deliver a comprehensive range of panelised modular building systems; commercial, industrial and residential applications – it is the natural choice for sustainable building outcomes that will reduce your carbon footprint in a practical and significant way.

- Ceilings
- Acoustic Ceiling, Wall and Flooring systems.
- Partition Walls and Wall Linings
- Modular Buildings

Durra Panel Features



Fire Resistance

Durra Panel is fire resistant and has been tested in accordance with AS 1530 parts 3, 4 and has global testing certification with FM Approvals as a Class 1 construction material. With fire rated panel to panel joints Durra Panel has a 1 hour fire rating. Tests are available from Ortech Industries on request. The carbonising action of the straw core when exposed to flame retards fire penetration of the panel. A unique, naturally fire resistant product that releases no dangerous toxic chemicals, no flaming droplets combined with a low smoke density index.



Thermal Resistance - Section J Compliance

Durra Panel (S50) provides an R-value of 0.62m²k/W. The combination of Durra Panel, a non-ventilated reflective airspace and roof insulation blanket in a typical Durra roof/ceiling system, will readily achieve the level of performance required by the Building Code of Australia. Insulation levels can be adjusted to meet any project specific requirements.



Acoustic Insulation

Durra Panel is a highly effective material for noise control, in particular, the low frequency sound energy associated with; aircraft, pumps, heavy industry, music theatres and the like. Durra Panel and Durra Panel Building Systems have a highly successful track record in reliable, cost effective noise control; commercial, industrial and residential applications - roof, ceiling, wall and flooring systems.



Strength & Impact Resistance

Durra Panel combines the desirable properties of high strength and high impact resistance. With 25mm of perimeter support, Durra Panel will safely support foot traffic during the construction process. With a solid 50mm thick panel core, Durra Panel will resist the knocks, blows associated with harsh environments and reduce maintenance costs.



Mould Resistance

The surface of Durra Panel is highly resistant to the growth of mould, being 7 times more resistant than conventional plasterboard materials. The solid panel core minimizes the potential for condensation to occur. It is also vapour diffusing and works well in areas of high humidity.

Ortech recommends the application of a painted finish to the exposed face of Durra Panel in any instance where the panels may be exposed to temporary atmospheric conditions; wind, rain and the like.



Termite & Rodent Resistance

The high density solid core of Durra Panel is not subject to attack from termites or rodents.

The wheat and rice straw fibre used to produce Durra Panel is not considered a food source for termites and white ants. Test results available on request.



Sustainability Benefits

- **Low Embodied Energy:** The Durra Panel manufacturing process combined with local biomass raw material results in exceptionally low embodied energy.
- **Positive Social Impact:** Innovatively utilizing an agricultural biomass by-product provides supplementary economic activity to regional areas - sustainability.
- **Recycling and Disposal:** Durra Panel is fully recyclable and readily biodegradable, and can be beneficially disposed of as mulch or soil conditioner, avoiding landfill disposal.
- **CO2 Emission Sequestration:** Based on a renewable biomass by-product, Durra Panel sequesters CO2 emissions from the atmosphere.
- **Indoor Environment Quality:** Avoiding the requirement for additive chemical binders common to other rigid board products, Durra Panel has exceptionally low VOC levels, contributing to healthier indoor environments.
- **Green Star Credits:** Refer to page 1.1.4
- **LEED Certification:** Refer to page 1.1.5



Durra Panel & Green Building Rating Tools

Durra Panel is the optimal rigid board construction product to assist your project in achieving its green building rating targets.

Green building ratings tools have been developed to provide property & construction industries over the world with objective measures of the environmental attributes of the design & construction phases of building projects. A variety of green building rating tools exist, including Green Star and LEED, developed and administered by the Green Building Council of Australia (GBCA) and U.S. Green Building Council (USGBC) respectively.

It is important to note that independent certification using green building rating tools validate the environmental attributes of a complete building design or as-constructed building - it is not possible to achieve a Green Star or LEED rating for any single product. However, the attributes of individual products can assist a project in achieving compliance with particular credits of the green building rating tool.

The benefits that Durra Panel can provide within Green Star and LEED green building rating tools are demonstrated below.

Green Star

Green Star – Office v3 Multi-Unit Res v1 Industrial v1 Healthcare v1 Education v1 Retail v1 Public Building v1 Office Interiors v1.1	Man- 7 Waste Management Man-6 Waste Management during Tenancy Fitout	Durra Panel waste can be mulched and readily diverted from landfill, assisting Contractors to achieve the required landfill diversion rates.
	IEQ-5 Thermal Comfort	The thermal properties provided by Durra Panel may assist with moderating surface temperatures, benefiting thermal comfort and attainment of points within this credit.
	IEQ-7 Internal Noise Levels IEQ-10 Internal Noise Levels	Durra Panel's excellent acoustic properties contribute to the management of internal noise levels, assisting projects to meet the requirements of the credit.
	IEQ-8 Volatile Organic Compounds IEQ-11 Volatile Organic Compounds	When used for interior walls or partitions, Durra Panel will assist projects in attaining points as the tested VOC emissions rate of Durra Panel is significantly lower than the maximum prescribed in the credit.
	IEQ-9 Formaldehyde Minimisation IEQ-12 Formaldehyde Minimisation	With no binding chemicals going in – there are no chemical emissions coming out! Unlike engineered wood products, Durra Panel avoids formaldehyde emissions due to the absence of additive chemical binders.
	Ene-0/Ene-1 Greenhouse Gas Emissions	When combined into a ceiling, roof or wall system, the thermal resistance provided by Durra Panel contributes to improved building fabric energy efficiency, minimizing heating and cooling energy consumption. This contributes to the attainment of points in this credit.
	Mat-3 Recycled Content & Reused Products and Materials	With its excellent impact resistance and greater durability than comparable products, Durra Panel offers reuse opportunities at building or fitout end of life. The use of reused Durra Panels will contribute to the attainment of points within this credit.
	Mat-7 Timber	Durra Panel is not considered a timber or engineered wood product, and as such is excluded from the scope of this credit (no impact on project).
	Mat-8 Design For Disassembly	Durra Building Systems incorporating Durra Panel are modular roofing and walling systems which are designed for disassembly. Utilizing a proprietary non-destructive fixing system, Durra Panel can be reclaimed intact for reuse or up-cycling applications. Durra Building Systems may contribute to the attainment of points within this credit.
	Mat-12 Assemblies Mat-14 Internal Walls Mat-14 Ceilings/Walls/Partitions Mat-3 Walls & Partitions Mat-8 Ceilings	The use of Durra Panel ceilings, internal walls and/or partitions will positively contribute to the attainment of points within these credits (as applicable).

Leed

LEED – New Construction Commercial Interiors Core & Shell Development Retail Schools Homes Neighbourhood Development Healthcare	MRc2 Construction Waste Management	Durra Panel waste can be mulched and readily diverted from landfill, assisting Contractors to achieve the required landfill diversion rates.
	MRc4 Recycled Content	The straw that makes up the primary core of the Durra Panel is a waste material as defined by LEED. Durra Panel will contribute to the project's recycled content and attainment of points within this credit.
	MRc5 Regional Materials	This credit rewards products that are manufactured regionally within a radius of 500 miles (800 kilometres) of the project site. A stronger weighting is given to products that are extracted, harvested or recovered, and manufactured, within this radius. Durra Panel will qualify for this stronger weighting. Durra Panel manufacturing facilities are located in the following global locations – Bendigo, Victoria (Australia) Polonnaruwa (Sri Lanka) For projects within the nominated distances from these manufacturing sites, Durra Panel will contribute to the attainment of points in this credit.
	MRc6 Rapidly Renewable Materials	Durra Panel's utilisation of straw to make the main body of the panels represents a readily available, rapidly renewable material. Typically growing on at least a yearly cycle, the straw used in the panels meets the requirements of the credit for a 10-year or shorter growing cycle.
	EAp2/EAc2 Energy Performance	When combined into a ceiling, roof or wall system, the thermal resistance provided by Durra Panel contributes to improved building fabric energy efficiency, minimizing heating and cooling energy consumption. This contributes to the attainment of points in the EAp2/EAc2 credits.
	IEQc4 Low-Emitting Materials New credit (2014): IEQc2 Low Emitting Materials	Durra Panel will assist the project in attaining points as the tested VOC emissions rate of Durra Panel is significantly lower than the maximum prescribed in the credit. The panels also contain no added urea-formaldehyde resins.
	IEQc5 Thermal Comfort	The thermal properties provided by Durra Panel may assist with moderating surface temperatures, benefiting thermal comfort and attainment of points within this credit.
	IEQc9 Acoustic Performance	Durra Panel's excellent acoustic properties contribute to the management of internal noise levels, assisting the project in meeting the requirements of the credit.
	New credit: MRc1 Building life Cycle Impact Reduction	This new credit incorporates an option to conduct a Life Cycle Assessment of the development. With very low embodied energy, Durra Panel scores very well on LCAs.
	New credit: MRc3 Building product disclosure and optimization - sourcing of raw materials	Durra Panel can be demonstrated to have environmentally preferable life cycle impacts. This credit also rewards products extracted or sourced in a responsible manner, with a higher weighting for products sourced <100 miles (160 kilometers) from the project site.

Durra Panel can positively contribute to your Green Star and LEED green building rating targets. Durra Panel – a sustainable product for a sustainable built environment.

Panel Finishes



Plain

The standard kraft liner finish of Durra Panel is an ideal surface for painting or facing with wallpapers or fabrics. Where specific applications require it, Durra Panel is also available clad with hardboard, cement sheet, plywood or colorbond steel.



Luxoltex Fine

A fine textured paint finish achieved by granulated particles suspended in white alkyd paint applied to the face of Durra Panel. This finely textured surface is highly reflective, durable and requires little to no maintenance, making it a suitable finish for either ceiling or wall applications.

Note: Special paint finishes available.



Hardboard

Finished by laminating hardboard to one side of plain Durra Panel. This surface is highly durable and requires little to no maintenance; ideal for painting.

Suitable for ceiling or wall applications in high impact areas.



Cement Sheet

Finished by laminating cement sheet to one side of plain Durra Panel. This surface adds a higher level of impact resistance and requires little to no maintenance. Suitable for ceiling or wall applications in high impact areas.



Plywood Clad

Durra Panel can be supplied with a decorative plywood laminated to the exposed face. A rich and warm ceiling finish for commercial and residential applications.



Acoustic Pattern - Plywood Finish

By laminating plywood to one side of plain Durra Panel, acoustic absorption control is achieved by means of a pattern of holes drilled into the plywood (lower) surface of the panel. Suitable for ceiling or wall applications in high impact areas requiring improved acoustical performance.



Acoustic Pattern - Hardboard Luxoltex Fine

By laminating hardboard to one side of plain Durra Panel, acoustic absorption control is achieved by means of a pattern of holes drilled into the hardboard (lower) surface of the panel. Suitable for ceiling or wall applications in high impact areas requiring improved acoustical performance.



Acoustic Pattern - Cement Sheet Luxoltex Fine

By laminating cement sheet to one side of plain Durra Panel, acoustic absorption control is achieved by means of a pattern of holes drilled into the cement sheet (lower) surface of the panel. Suitable for ceiling or wall applications requiring an additional level of impact resistance above a hardboard laminate as well as improved acoustical performance.

Note: Durra Panel can be supplied with a variety of laminated finishes to the back face for enhanced acoustic performance:

- 3.2mm Hardboard
- Cement Sheet 4.5 or 6mm thickness



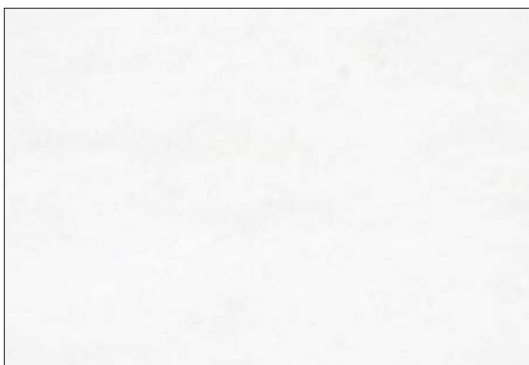
Steel Facing

By laminating colorbond steel sheeting to one side of plain Durra Panel; an ideal finish for clean room manufacturing environments and insulated panel systems for walls and ceilings.

Available in standard Colorbond colours.

Soundsorb Finish

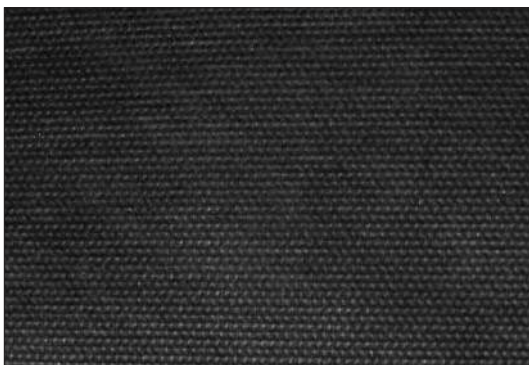
For performance specifications that require internal noise control, Durra Panel can be supplied with a range of pre finished Soundsorb facings. The Soundsorb finish can be varied to suit the aesthetic and acoustic performance requirements of your project. Soundsorb consists of Durra Panel, and an absorber (insulation) cassette.



Soundsorb - Plain

An insulation cassette with a polyester finish.

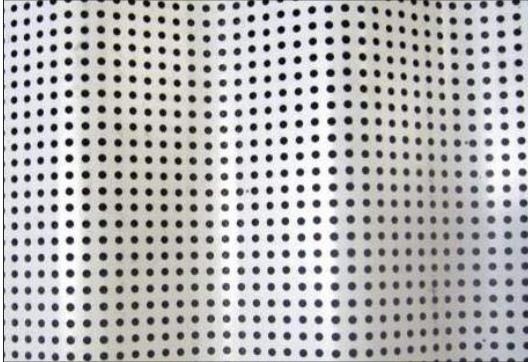
Available in Black, Grey and White.



Soundsorb - Fabric Faced

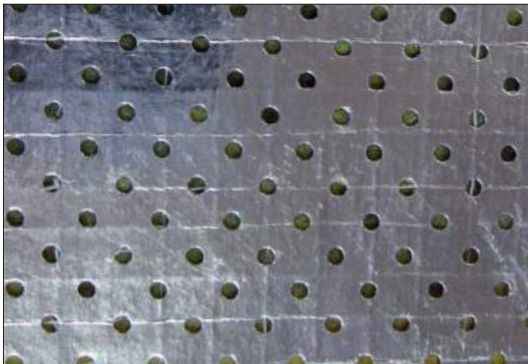
An insulation cassette with a fabric faced finish.

Available in Black and White.

Soundsorb Finish Continued**Soundsorb - Perforated Corrugated**

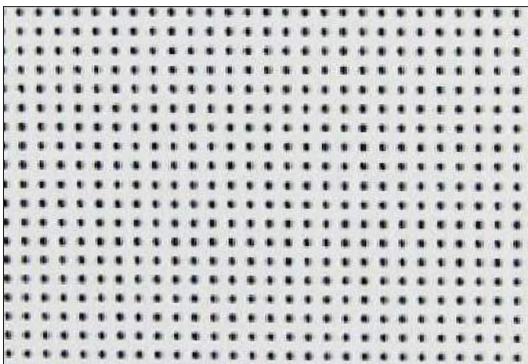
An insulation cassette with a perforated corrugated finish.
Standard Perforation: 11% Open Area

Available in standard Colorbond colours.

**Soundsorb - Perforated Foil**

An insulation cassette with a perforated foil finish.

Available in white or reflective foil.

**Soundsorb - Perforated Aluminium**

An insulation cassette containing perforated aluminium pans.
Standard Perforation: 11% Open Area

Available in standard Colorbond colours.

Note: Durra Panel can be supplied with a variety of laminated finishes to the back face for enhanced acoustic performance:

- 3.2mm Hardboard
- Cement Sheet 4.5 or 6mm thickness

Soundsorb Finishes Schedule

SOUNDSORB TYPE	25mm Soundsorb Panel: LAMINATED TO S50 DURRA PANEL		50mm CASSETTE: S50 DURRA PANEL WITH SEPARATE 50MM ACOUSTIC CASSETTE		75mm CASSETTE: S50 DURRA PANEL WITH SEPARATE 75MM ACOUSTIC CASSETTE	
	25mm x 35Kg/m ³	25mm x 48Kg/m ³	50mm x 35Kg/m ³	50mm x 48Kg/m ³	75mm x 35Kg/m ³	75mm x 48Kg/m ³
POLYESTER: PLAIN	✓	✓	M.F	M.F	M.F	M.F
FIBREGLASS: FABRIC FACED	✓	✓	M.F	✓	M.F	✓
FIBREGLASS: PERFORATED FOIL	✓	✓	M.F	✓	M.F	✓
POLYESTER: PERFORATED CORRUGATED FACED*	✓	✓	✓	✓	✓	✓
FIBREGLASS: PERFORATED CORRUGATED FACED*	✓	✓	✓	✓	✓	✓
POLYESTER: PERFORATED ALUMINIUM*	✓	✓	✓	✓	✓	✓
FIBREGLASS: PERFORATED ALUMINIUM*	✓	✓	✓	✓	✓	✓

✓ = Acoustic Insulation spans across typical 1200mm grid.

M.F = Insulation requires on site mechanical fixings to Durra Panel at mid span.

General Recommendations: Handling

Manual Handling

When handling Durra Panel, always lift one long edge so that the other edge provides support to the panel. Carry all panels on edge – **DO NOT CARRY FLAT**. This will minimise damage to the surface. Packs of Durra Panel may be unloaded by forklift or crane if available. When unloading and stacking pre-finished panels by hand, care must be exercised to prevent damage to the pre-finished surfaces. Avoid face damage by not sliding panels over each other and make sure hands are clean at all times.

Storage

It is important to store Durra Panel well protected from rain and dampness. Keep panels off the ground, INDOORS, well sheeted, away from moisture. Panels should be stacked flat, on suitable packing on firm level ground.

Where Durra Panel cannot be stored undercover, stacks may be protected from the weather with temporary shelters. Alternatively, as a short term measure only, stacks should be covered with tarpaulins or heavy duty plastic sheet installed in such a way as to completely prevent water entry. Durra Panel packs should not be left in a plastic covered state for extended periods as sweating may occur which will result in damage to product surfaces.

Note: Durra Panel packs can be ordered with a shower proof plastic wrapping. This light weight plastic wrapping is only suitable for temporary protection.

Exposure to Weather

Care must be taken to make sure that the panels have no surface damage cuts or tears. All cut edges must be sealed with the aluminium reinforced tape available from Ortech Industries.

Should damage have occurred to the panel, simply apply the reinforced aluminium foil tape to ensure water or moisture cannot gain access to the panel core.

Weather Proofing

The permanent roof covering over the Durra Panel must be installed as soon as possible after the panel has been fixed. If any delay is incurred in fixing the roofing the Durra Panel must be **“temporary weathered”**, that is, covered with the roofing material, tarpaulins, in such a way as to completely prevent water entry.

If Durra Panel is to be left exposed to the elements during the construction process please contact Ortech Industries with regard to the application of a weather resistant panel finish.

General Recommendations: Installation

Panelised Modular Installation - Durra Lifting Frame

Durra Panel and Durra Steel Sections can be pre-assembled on site at ground level into large panelised modules that are then crane hoisted into position using the Durra Lifting Frame; roof/ceiling and wall systems. This innovative method of installation saves valuable time, reduces project costs and significantly improves site safety with the majority of working at height time eliminated from the project. Damaged or defective panels must not be installed and must be replaced prior to installation.

Hand Installation

If the Durra Steel Sections have already been installed by hand as per C or Z purlins, the Durra Panel is crane hoisted directly from transport to the roof structure using approved lifting slings. Durra Panel should be ordered in marked packs of approximately twelve boards per pack and be placed only where the roof structure will safely carry concentrated loads. Damaged or defective panels must not be installed and must be replaced prior to installation.

Where packs of Durra Panel are to be placed on top of Durra Steel Sections, it is essential to cross brace the beam webs to ensure torsional stability. Land the packs over the top of structural steel rafters. Never place packs of Durra Panel at mid-span points.

Directional Arrows

Durra Panel Acoustic Finish is supplied with directional arrows on the upper face. Durra Panels must be installed with all arrows pointing in the same direction.

Walking on the Panel

With 25mm of perimeter support, Durra Panel will safely support workmen carrying hand and power tools or other installation equipment. Avoid stacking other building materials or equipment on boards and avoid point loading such as ladders, scaffold poles etc. **Durra Panel must not be walked on until Tee Units have been bolted into position.**

Durra Panel meets and exceeds the ultimate load requirement of AS 1562 - 1980 and AS 1170.1 - 1989.

Ventilation

Ensure adequate ventilation to all rooms where steam laden atmospheres may occur, such as kitchens, bathrooms, laundries etc.

Decoration

The Kraft liner finish of Durra Panel may be readily painted using standard paints and techniques. Durra Panel is a natural product, the surface finish is not as smooth as plaster board. It is not recommended to use gloss paint on Durra Panel. It is also an ideal surface for facing with wallpapers, vinyls and fabrics. A wide range of factory pre-finished surfaces are also available to suit your project needs.

* Ortech Industries recommends Durra Panels to be painted.

Frame for Strength

Durra Panel is stronger in width than in length, therefore the main support must be provided along the machine made (long) edges of the panel. An arrow on the back face of Durra Panel confirms panel orientation for installation. All arrows must point in the one direction.

Support All Edges

Durra Panel must be provided with 25mm wide support to all edges. In areas where Durra Panel is not provided with direct support from Durra Steel Sections a hardboard packer or similar resilient item must be inserted between the Durra Panel and the underside supporting structural member.

Verges and eaves should be framed to withstand loads imposed by ladders etc. It is recommended that cement sheet clad or Colorbond steel clad Durra Panel is used in all external applications.

Fasten Well

When used in conjunction with Durra Steel Sections Durra Panel must be firmly wedged down with the galvanised steel Durra Panel Wedges (see **Ref 3.5.1**). The Wedges should be placed in **alternating directions** through the wedge slots (spaced at approximately 450mm centres) in the web of the beams. Including through the lugs of the Durra Cross Tee Units

Durra Panel should be nailed down to timber beams with Durra 90mm flat-head nails spaced at 450mm centres around the perimeter of the panel.

Fixing to Durra Panel

Lightweight fittings may be attached to Durra Panel with glue and coarse thread wood screws. Where heavy fittings or items under sustained stress are to be fixed to Durra Panel, special fixing is required such as a nylon wall mate.

Cutting Durra Panel

Durra Panel may be cut with power saws, hole saws or carpenters ordinary hand-saws. Blades should be coarse ripping type and 'set' should be about twice the normal for woodwork. If necessary, use a wedge to keep the saw cut open. The newly cut edges of Durra Panel must be sealed with Durra Aluminium Sealing Tape.

Note: For Durra Panel resealing procedure, please refer to reference page 1.3.8

Recommended Tools

Reciprocating Saw 	Jigsaw 
235mm(9-1/4") Circular Saw 	Cordless Drill/Driver 
Holesaw Kit 	230mm(9") Angle Grinder 

Specifications



Durra Panel S50



Product Name	Durra Panel S50 Plain
Nominal Thickness	50mm
Weight	18.5 kg/m ² (nominal)
Width (Standard)	1187mm
Maximum Length	3600mm
Face Colour	Brown (Kraft liner)
* Strength	Point load 5.8kN
Impact Resistance	High
Thermal Conductivity	0.081 W/mK
Thermal Resistance	0.62 m ² W/k
Specific Heat Capacity	1050 J/kgK
Embodied Energy	12.6 MJ/m ²
VOC Emission rate (ASTM D5116)	<0.05 mg/m ² /hr (7 days)
Biscuit Slots	Available

Durra Panel S58

Product Name	Durra Panel S58 Plain
Nominal Thickness	58mm
Weight	22 kg/m ² (nominal)
Width (Standard)	1187mm
Maximum Length	3000mm
Face Colour	Brown (Kraft liner)
* Strength	Point load 5.8kN
Impact Resistance	High
Thermal Conductivity	0.081 W/mK
Thermal Resistance	0.72 m ² W/k
Specific Heat Capacity	1050 J/kgK
Embodied Energy	12.6 MJ/m ²
VOC Emission rate (ASTM D5116)	<0.05 mg/m ² /hr (7 days)
Biscuit Slots	Available

* Note : Point load testing at mid span of S50 Durra Panel Plain Finish supported by Durra Steel Sections spaced at 1200mm centres.

Quick Reference Chart: Product Weights & Maximum Lengths

DURRA PANEL FINISH	THICKNESS (NOMINAL)	WEIGHT Kg / M ² (NOMINAL)	MAXIMUM LENGTHS
S50 PLAIN / PAINTED	50mm	18.50	≤ 3600mm
S58 PLAIN / PAINTED	58mm	22.00	≤ 3000mm
S50 CLAD 3.2MM HARDBOARD (1 FACE) PLAIN / PAINTED / ACOUSTIC PATTERN	53.20mm	23.30	≤ 3600mm
S50 CLAD 4.0MM PLYWOOD (1 FACE) PLAIN / ACOUSTIC PATTERN	54mm	23.00	≤ 2400mm
S50 CLAD 4.5MM CEMENT SHEET (1 FACE) PLAIN / PAINTED / ACOUSTIC PATTERN	54.50mm	27.19	≤ 3000mm
S50 CLAD 6MM CEMENT SHEET (1 FACE) PLAIN / PAINTED	56mm	29.52	≤ 3000mm
S50 CLAD 0.55MM COLORBOND STEEL (1 FACE)	50.55mm	24.00	≤ 3600mm
(S50) SOUNDSORB 25MM X 48KG/M ³ POLYESTER / FIBREGLASS:FABRIC FACED	75mm	23.00	≤ 3600mm
(S50) SOUNDSORB 50MM X 48KG/M ³ CASSETTE FIBREGLASS:FABRIC FACED	100mm	26.00	≤ 3600mm
(S50) SOUNDSORB 75MM X 48KG/M ³ CASSETTE FIBREGLASS:FABRIC FACED	125mm	27.00	≤ 3600mm
(S50) SOUNDSORB 25MM X 48KG/M ³ POLYESTER / FIBREGLASS PERFORATED CORRUGATED FACED	75mm	29.00	≤ 3600mm
(S50) SOUNDSORB 50MM X 48KG/M ³ CASSETTE POLYESTER / FIBREGLASS PERFORATED CORRUGATED FACED	115mm	31.00	≤ 3600mm
(S50) SOUNDSORB 75MM X 48KG/M ³ CASSETTE POLYESTER / FIBREGLASS PERFORATED CORRUGATED FACED	140mm	32.00	≤ 3600mm

Material Safety Data Sheet

Ortech Durra Panel - Compressed Strawboard

Non Hazardous according to criteria of ASCC. (Australian Safety and Compensation Council)

1. Supply Company Identification

Product Name: Durra Panel

Supplier: Ortech Industries PTY LTD
91 Allingham Street, Golden Square, Bendigo, Victoria 3555
Ph: +61 3 9580 7766 Fax: +61 3 9587 1628
www.ortech.com.au ortechn@ortech.com.au

2. Hazards Identification

Based on available information, this material is not classified as hazardous according to the criteria of ASCC. Australia. Not Classified as dangerous goods by the criteria of the Australian Dangerous Goods Code.

Poisons schedule: none allocated.

3. Composition/Information of Ingredients

Wheat or rice straw - 96.22%

Kraft liner - 3.55%

Water based PVA glue - 0.23%

4. First Aid Measures

Swallowed: Unlikely to occur. May cause slight gastric irritation

Inhaled: Dust from cutting may cause respiratory irritation (Remove patient from dusty area)

Eye: Dust from cutting product may cause mild irritation (Remove patient from dusty area and wash eyes)

5. Fire Fighting Measures

Durra Panel in its compressed state is considered to be fire resistant.

Straw dust produced in large quantities when cutting Durra Panel is considered a fire risk and work areas should be kept clean at all times.

Fires should be extinguished with water, foam or dry chemical extinguisher.

6. Accidental Release Measures

Not applicable.

7. Handling and Storage

Handling: Avoid eye contact and inhalation of dust when cutting product.

Storage: Durra Panel should be stored in a clean dry environment.

8. Exposure Controls/Personal Protection

Exposure controls: Adequate dust extraction measures should be used when cutting Durra Panel in a confined area.

Personal protection: Dust mask/respirator, overalls and goggles should be worn when cutting Durra Panel.

9. Physical and Chemical Properties

Appearance: compressed rice or wheat straw (natural colour) encased in a kraft liner

Boiling point: Not applicable

Melting point: Not applicable

Vapour pressure: Not applicable

Specific gravity: Not applicable

10. Stability and Reactivity

Reactivity with common substances, for example air and water: Not reactive.

11. Toxicological Information

No adverse health affects if the product is handled in accordance with this safety data sheet and produce label.
Refer sections 4 and 8 of this MSDS.

12. Ecological Information

Avoid waterways contamination.

13. Disposal Considerations

Dispose of Durra Panel waste in a normal landfill in accordance with the local and state regulations. Do not use waste as cooking or barbeque fuel.

14. Transport Information

Road, Rail, Air and Sea: Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code for transport by Road, Rail, Air or Sea.

15. Regulatory Information

Based on available information, Durra Panel is not classified as hazardous or dangerous according to criteria of ASCC.

Poisons schedule (Australia): Not applicable.

16. Other Information

Contacts Person / point: General Manager, Ortech Industries PTY LTD +61 3 9580 7766 (Business hours)
This MSDS was issued in accordance with ASCC regulations.

Issue Date: 20.01.2014

Revision: 3

Replaces sheet dated: 03.05.2012

Durra Panel Resealing Procedure

S50 and S58 Durra Panel resealing procedure for onsite works, relating to Durra Panel installed between Durra Steel Sections.

1. Resealing must be carried out using Durra PPC self-adhesive reinforced foil tape, available from Ortech Industries.
2. The resealing tape is available in 50M rolls and is 120mm in width.
3. Panels that have been site cut should be placed on a table, or similar stable platform with the exposed ceiling face up in readiness for resealing.
4. Durra Panel must be dry and dust free before applying the resealing tape.
5. A length of resealing tape is cut from the roll and test fitted before removing the backing tape. It is recommended to allow sufficient length for a 50mm return width around all corners as indicated in image 1 below.
6. After removing the tape backing material the resealing tape is applied to the exposed upper face of the panel and pushed down - minimum width of 20mm and maximum width of 25mm, from the cut edge in a straight line across the cut to be resealed.
NOTE: The 50mm return widths should be even at each corner.
7. The resealing tape is then pulled down over the panel core and returned a nominal 40mm to the unexposed panel face.
8. The 50mm return widths at each corner are pulled around and folded in to complete the application process.
9. The new seal must be wiped over with a dry rag and pressed down all over to ensure continuity of adhesive between all surfaces.
10. For situations where Durra Panel is not installed between Durra Steel Sections, please contact Ortech Industries for appropriate taping application dimensions

Image 1



TAPED END ONLY

Minimum width = 20mm
Maximum width = 25mm

50mm return width

Durra Panel
Exposed Face

Image 2



TAPED ALL AROUND

Durra Panel and Durra Steel Sections

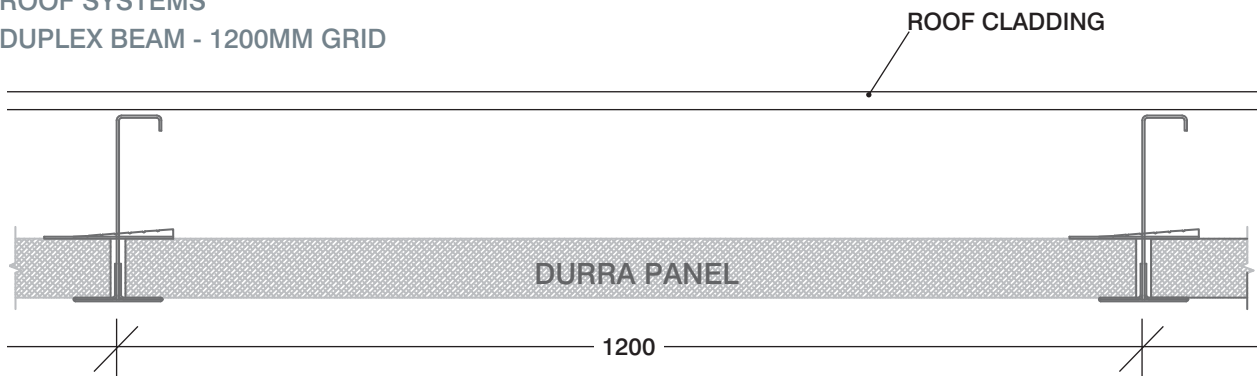
Visual Reference Chart - Roof / Ceiling Systems

Note: Refer to sections 4, 5, 6 and 8 of the Technical Manual for further applications and detail drawings

Note: Reflective foil and insulation blanket omitted for clarity

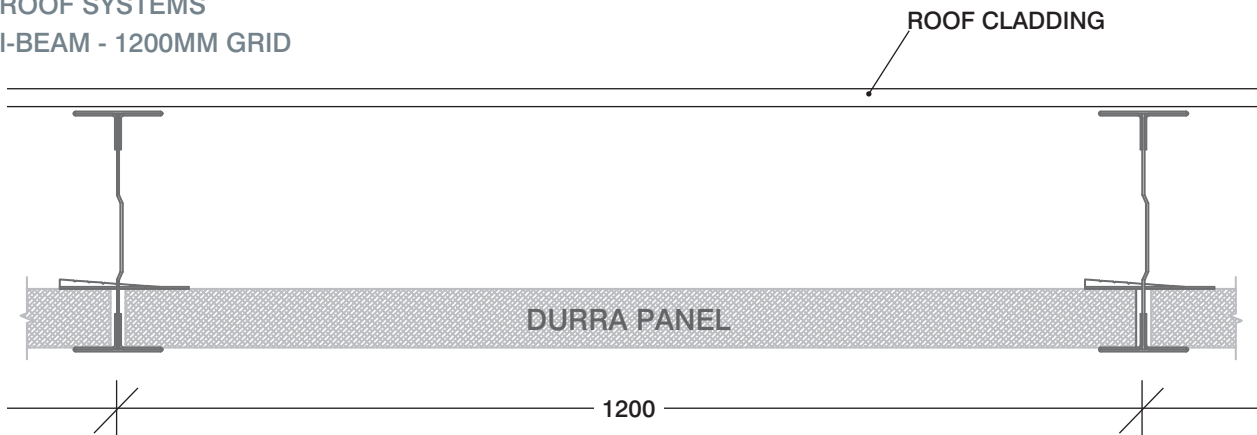
ROOF SYSTEMS

DUPLEX BEAM - 1200MM GRID



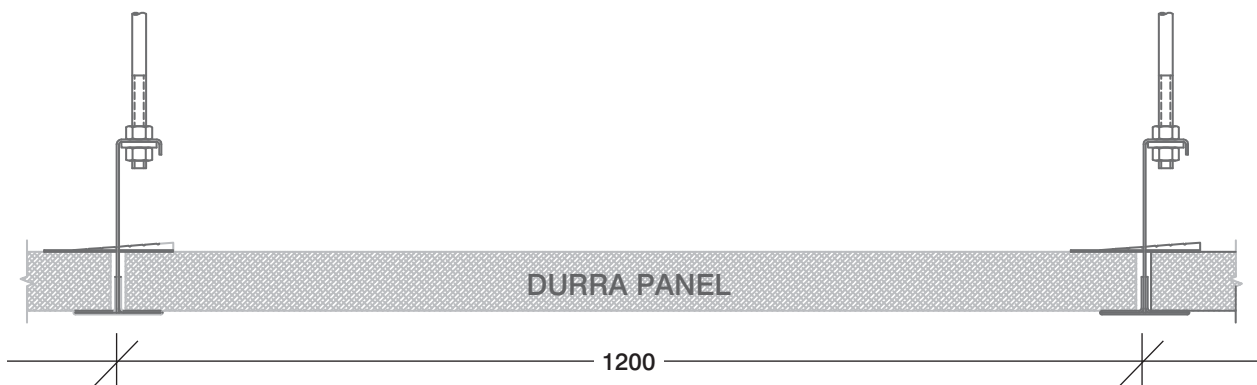
ROOF SYSTEMS

I-BEAM - 1200MM GRID



WALKABLE SUSPENDED CEILINGS

DUPLEX BEAM - 1200MM GRID



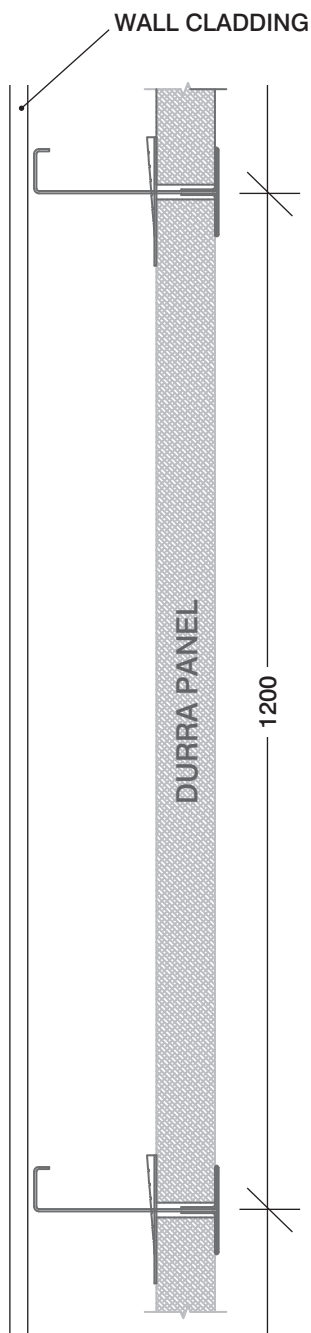
Durra Panel and Durra Steel Sections

Visual Reference Chart - Wall Systems

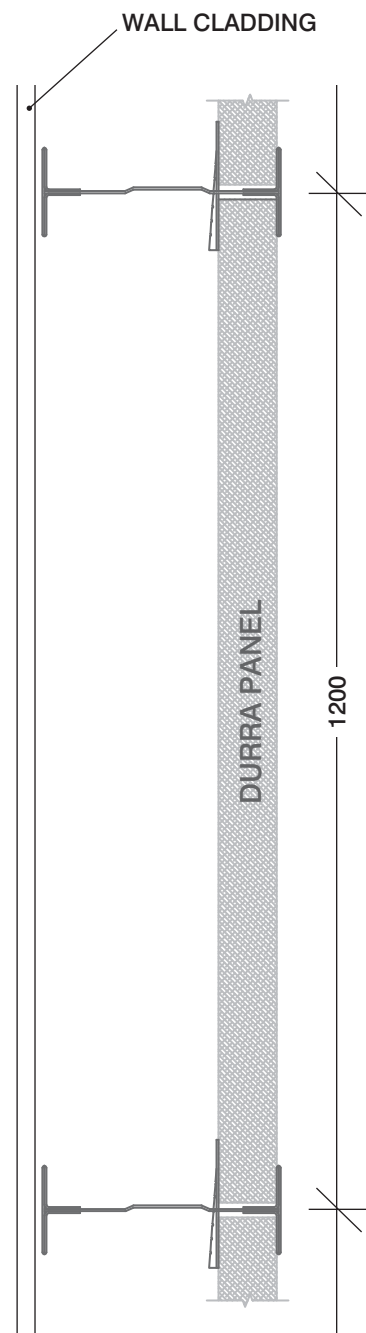
Note: Refer to sections 4, 5, 6 and 8 of the Technical Manual for further applications and detail drawings

Note: Reflective foil and insulation blanket omitted for clarity

WALL SYSTEMS
DUPLEX BEAM - 1200MM GRID



WALL SYSTEMS
I-BEAM - 1200MM GRID



Section 2

Thermal Performance

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BCA Section J Assessment	
Table 1 - Climate Zone Of Australia	
Table 2 - Classes Of Buildings	
Table 3 - Table J1.3A Roofs And Ceilings	
Analysis Of Durra Roof / Ceiling System - Low Pitch 0-10°	2.1.4
Total R-Value Calculations - Guidance Values	2.1.5
System A	
System B	
System C	
Glossary Of Terms.....	2.1.8

NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Durra Panel Roof / Ceiling Systems

Section J Compliance

Introduction

Durra Panel (S50) has excellent thermal insulation properties providing an R-value of 0.62m²k/W. The combination of Durra Panel, a non-ventilated reflective airspace and roof insulation blanket in a typical Durra roof /ceiling system, will readily achieve the level of thermal rating performance required by the Building Code of Australia. Insulation rating levels can be adjusted to meet project specific requirements.

Durra Panel Total R-Value Calculations - Guidance Values

This section of our Technical Manual provides guidance to project designers for the level of thermal performance that can be expected from a variety of Durra Panel roof / ceiling systems. We have included tables containing a comprehensive and robust set of 82 R values - winter / summer scenarios, that have been formulated for three of our more typical Durra Panel roof assemblies with seven beam depths (unventilated reflective air spaces) and two generic roof pitches (lower pitch and higher pitch). Reference 2.1.5

BCA Section J Assessment

The Building Code of Australia (BCA) is 'a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia whilst allowing for variations in climate and geological or geographic conditions'.

Section J of the BCA relates to Energy Efficiency and provides for the minimum acceptable level of thermal performance required for roof systems. The objective of Section J is **'to reduce greenhouse gas emissions by efficiently using energy'**.

Section J Assessment and Compliance reports are required for commercial buildings as part of the Development Application process to demonstrate a designs ability to comply with the BCA.

Australia is divided into 8 climate zones. The minimum level of deemed to satisfy thermal rating for roofs will vary according to the buildings location within Australia. The minimum level of deemed to satisfy thermal rating for roofs will also depend on the Class of building that is to be undertaken in a particular climate zone. To calculate the minimum level of R-Value that will be required for your project use the following steps;

Step 1: Check the location of your project against the BCA climate zone map of Australia and select the corresponding climate zone, 1-8 using Table 1, Reference 2.1.2

Step 2: Select the appropriate Building Class for your project; Class 1-10 using Table 2, Reference 2.1.3

Step 3: Select the Minimum Total R-Value that will be required for your project using Table 3, Reference 2.1.3

Table 1 - Climate Zone Map Of Australia

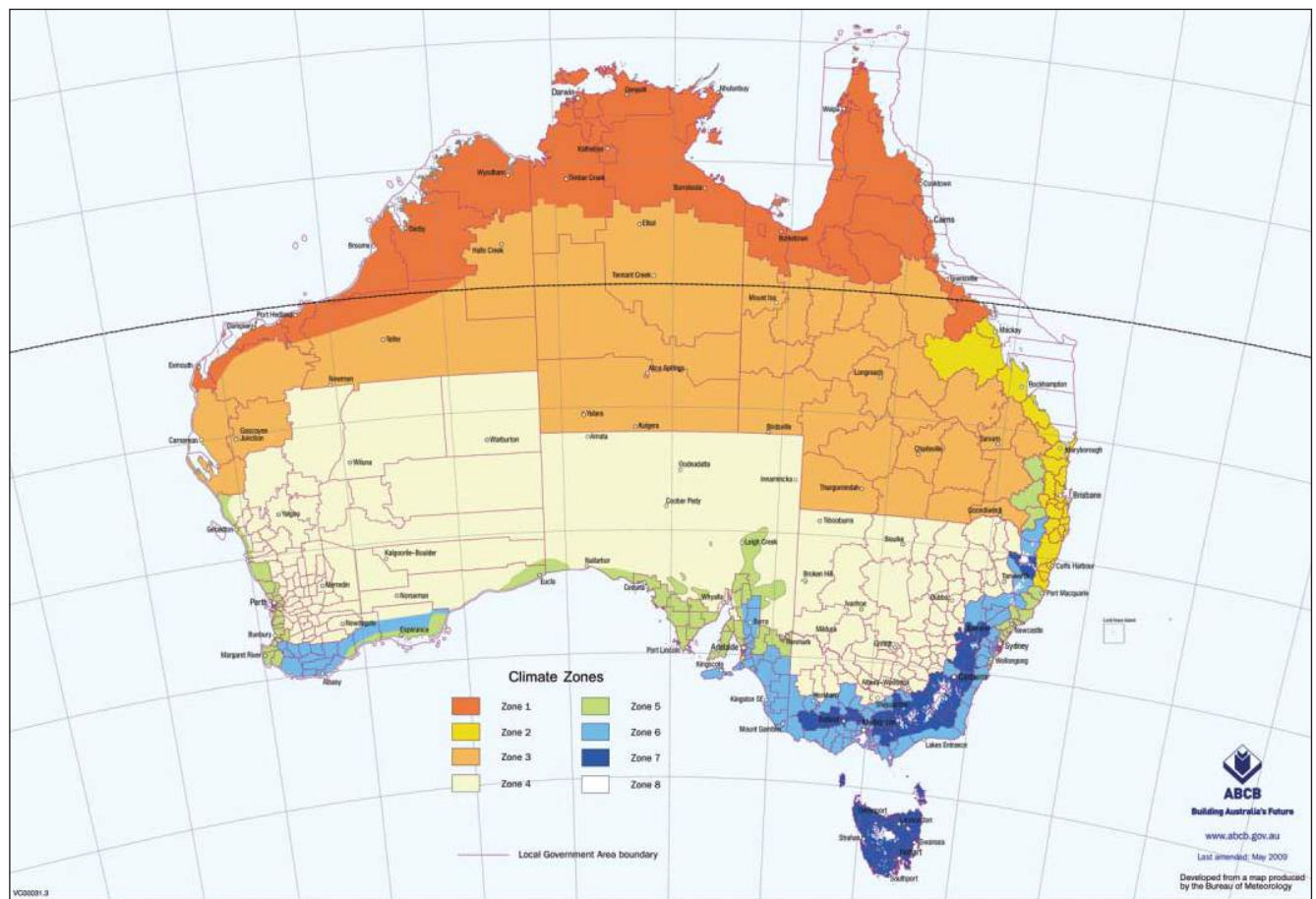


Table 2 - Classes Of Buildings

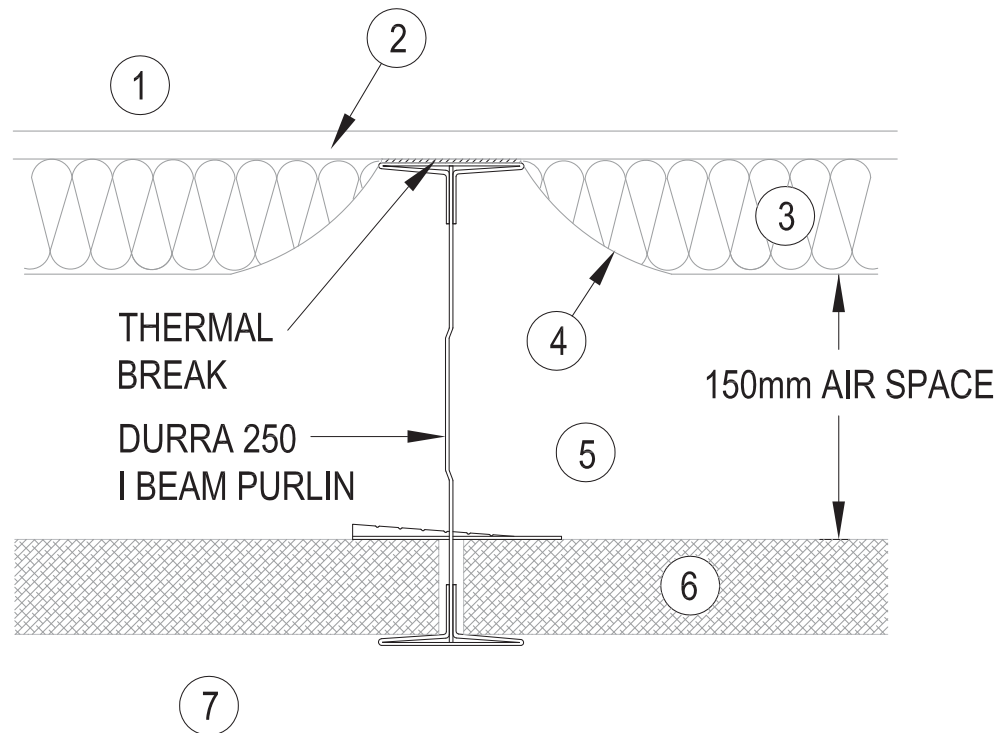
CLASS 1	Class 1A - A single dwelling being a detached house or one or more attached dwelling. Class 1B - Boarding/guest house or hostel not exceeding 300m ² and not more than 12 people reside. Which is not located above or below another dwelling or another Class of building other than a private garage.
CLASS 2	A building containing 2 or more sole occupancy units each being a separate dwelling
CLASS 3	A resident building, other than a class 1 or 2, which is common place of long term or transient living for a number of unrelated persons.
CLASS 4	A dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building
CLASS 5	An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.
CLASS 6	A shop or other building for the sale of goods by retail or the supply of services direct to the public.
CLASS 7	A building which Class 7A - Is a carpark Class 7B - Is for storage or display of goods or produce for sale by wholesale
CLASS 8	A laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale or gain.
CLASS 9	A building of a public nature Class 9A - A health care building Class 9B - An assembly building in a primary or secondary school, but excluding any other parts of the building that are of another class. Class 9C - An aged care building
CLASS 10	A non habitable building or structure Class 10A - A private garage, carport, shed or the like Class 10B - A structure being a fence, mast, antenna, retaining or free standing wall, swimming pool or the like.

Table 3 - Table J1.3A Roofs And Ceilings (Minimum Total R-Value)

SOLAR ABSORPTANCE	CLIMATE ZONE	1, 2, 3, 4 AND 5	6	7	8
	DIRECTION OF HEAT FLOW	DOWNWARDS	UPWARDS		
LIGHT COLOUR ROOF	Minimum Total R-Value for a roof or ceiling with a roof upper surface solar absorptance value of not more than 0.4	3.2	3.2	3.7	4.8
MEDIUM COLOUR ROOF	Minimum Total R-Value for a roof or ceiling with a roof upper surface solar absorptance value of more than 0.4 but not more than 0.6	3.7	3.2	3.7	4.8
DARK COLOUR ROOF	Minimum Total R-Value for a roof or ceiling with a roof upper surface solar absorptance value of more than 0.6	4.2	3.2	3.7	4.8

Analysis Of Durra Roof/Ceiling System - Low Pitch 0-10°

Total R-Value Calculation - Guidance Values



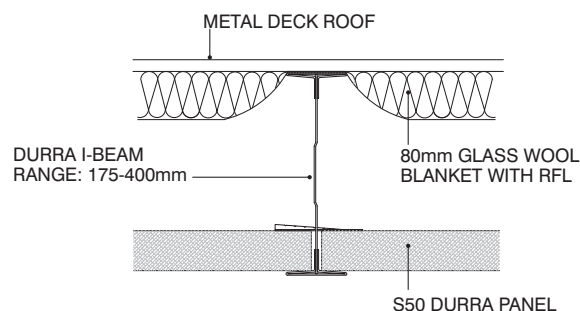
REF	PROPERTIES	THERMAL RESISTANCE R (M2 K/W)
		HEAT FLOW DOWN - SUMMER
1	Outdoor air film	0.04
2	Metal deck roof	0.00
3	80mm glasswool insulation blanket (uncompressed)	1.78
4	Reflective foil laminate (sisalation)	0.00
5	Unventilated reflective airspace	1.61
6	S50 Durra Panel	0.62
7	Indoor air film	0.16
TOTAL R-VALUE		4.21

Note 1: Roofing insulation blanket must be provided with sufficient space to recover its nominal design thickness between purlins. As roof safety mesh is not required for use with Durra Panel roof / ceiling systems, the insulation blanket can be readily dished between purlins with enough space to recover nominal design thickness and stated R Value level of performance.

Note 2: Additional insulation can be added to the assembly to suit the level of thermal insulation required.

Total R-Value Calculations Guidance Values

System A



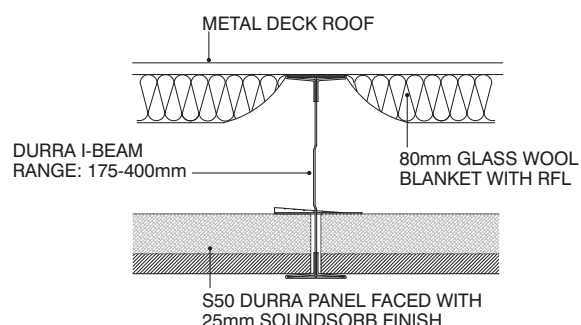
LOWER PITCH ROOF / CEILING (0-10°) R VALUES (M²K/W)		
DURRA I-BEAM PURLIN	SYSTEM A - METAL DECK CLADDING, 80MM GLASSWOOL BLANKET (UNCOMPRESSED, WITH RFL), UNVENTILATED REFLECTIVE AIR SPACE, S50 DURRA PANEL CEILING	
	SUMMER	WINTER
175 I-BEAM	3.5	3.1
200 I-BEAM	3.8	3.2
225 I-BEAM	4.0	3.2
250 I-BEAM	4.2	3.3
300 I-BEAM	4.5	3.4
350 I-BEAM	4.7	3.4
400 I-BEAM	4.8	3.4

HIGHER PITCH ROOF / CEILING (10-30°) R VALUES (M²K/W)		
DURRA I-BEAM PURLIN	SYSTEM A - METAL DECK CLADDING, 80MM GLASSWOOL BLANKET (UNCOMPRESSED, WITH RFL), UNVENTILATED REFLECTIVE AIR SPACE, S50 DURRA PANEL CEILING	
	SUMMER	WINTER
175 I-BEAM	3.2	3.0
200 I-BEAM	3.5	3.0
225 I-BEAM	3.6	3.1
250 I-BEAM	3.8	3.1
300 I-BEAM	4.0	3.2
350 I-BEAM	4.2	3.2
400 I-BEAM	4.4	3.3

* Total R-Values calculated using THERM 7.1 (Lawrence Berkeley National Laboratory) with AS/NZS 4859.1:2002 (Appendix K) boundary conditions; (18°C/12°C Winter, 24°C/36°C Summer), reflective surface emissivity 0.05, -0.65% resistance change (mean temperature increase), and inclusive of interior/exterior air films. These values are estimates of thermal performance in general accordance with the intent of AS/NZS 4859.1:2002 as calculated by THERM 7.1, however do not constitute certification of the construction system. Values are general for the roof/ceiling pitch range indicated. The presented data are to be used as a reference guide only.

Total R-Value Calculations Guidance Values

System B



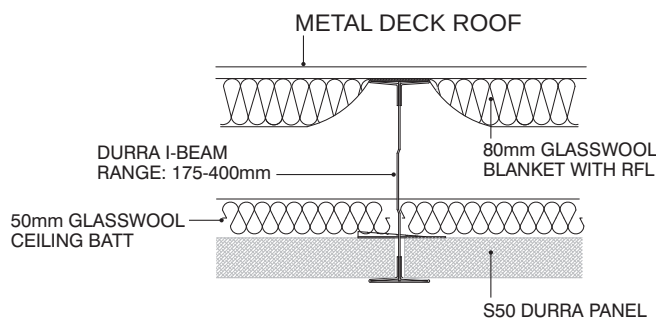
LOWER PITCH ROOF / CEILING (0-10°) R VALUES (M²K/W)		
DURRA I-BEAM PURLIN	SYSTEM B - METAL DECK CLADDING, 80MM GLASSWOOL BLANKET (UNCOMPRESSED, WITH RFL), UNVENTILATED REFLECTIVE AIR SPACE, S50 DURRA PANEL CEILING, 25MM SOUNDSORB FACING	
	SUMMER	WINTER
175 I-BEAM	3.7	3.7
200 I-BEAM	4.1	3.8
225 I-BEAM	4.4	3.9
250 I-BEAM	4.7	4.0
300 I-BEAM	5.0	4.1
350 I-BEAM	5.2	4.1
400 I-BEAM	5.4	4.1

HIGHER PITCH ROOF / CEILING (10-30°) R VALUES (M²K/W)		
DURRA I-BEAM PURLIN	SYSTEM B - METAL DECK CLADDING, 80MM GLASSWOOL BLANKET (UNCOMPRESSED, WITH RFL), UNVENTILATED REFLECTIVE AIR SPACE, S50 DURRA PANEL CEILING, 25MM SOUNDSORB FACING	
	SUMMER	WINTER
175 I-BEAM	3.6	3.6
200 I-BEAM	3.9	3.7
225 I-BEAM	4.1	3.8
250 I-BEAM	4.3	3.8
300 I-BEAM	4.6	3.9
350 I-BEAM	4.9	4.0
400 I-BEAM	5.0	4.0

* Total R-Values calculated using THERM 7.1 (Lawrence Berkeley National Laboratory) with AS/NZS 4859.1:2002 (Appendix K) boundary conditions; (18°C/12°C Winter, 24°C/36°C Summer), reflective surface emissivity 0.05, -0.65% resistance change (mean temperature increase), and inclusive of interior/ exterior air films. These values are estimates of thermal performance in general accordance with the intent of AS/NZS 4859.1:2002 as calculated by THERM 7.1, however do not constitute certification of the construction system. Values are general for the roof/ceiling pitch range indicated. The presented data are to be used as a reference guide only.

Total R-Value Calculations Guidance Values

System C



LOWER PITCH ROOF / CEILING (0-10°) R VALUES (M²K/W)		
DURRA I-BEAM PURLIN	SYSTEM C - METAL DECK CLADDING, 80MM GLASSWOOL BLANKET (UNCOMPRESSED, WITH RFL), UNVENTILATED REFLECTIVE AIR SPACE, 50MM GLASSWOOL CEILING BATT, S50 DURRA PANEL CEILING	
	SUMMER	WINTER
175 I-BEAM	3.6	3.7
200 I-BEAM	4.2	4.2
225 I-BEAM	4.6	4.3
250 I-BEAM	4.9	4.4
300 I-BEAM	5.3	4.5
350 I-BEAM	5.6	4.6
400 I-BEAM	5.8	4.6

HIGHER PITCH ROOF / CEILING (10-30°) R VALUES (M²K/W)		
DURRA I-BEAM PURLIN	SYSTEM C - METAL DECK CLADDING, 80MM GLASSWOOL BLANKET (UNCOMPRESSED, WITH RFL), UNVENTILATED REFLECTIVE AIR SPACE, 50MM GLASSWOOL CEILING BATT, S50 DURRA PANEL CEILING	
	SUMMER	WINTER
175 I-BEAM	3.6	3.7
200 I-BEAM	4.1	4.1
225 I-BEAM	4.3	4.2
250 I-BEAM	4.6	4.2
300 I-BEAM	4.9	4.3
350 I-BEAM	5.1	4.4
400 I-BEAM	5.3	4.5

* Total R-Values calculated using THERM 7.1 (Lawrence Berkeley National Laboratory) with AS/NZS 4859.1:2002 (Appendix K) boundary conditions; (18°C/12°C Winter, 24°C/36°C Summer), reflective surface emissivity 0.05, -0.65% resistance change (mean temperature increase), and inclusive of interior/exterior air films. These values are estimates of thermal performance in general accordance with the intent of AS/NZS 4859.1:2002 as calculated by THERM 7.1, however do not constitute certification of the construction system. Values are general for the roof/ceiling pitch range indicated. The presented data are to be used as a reference guide only.

Glossary Of Terms

k Value (W/mK) Thermal conductivity	This is a measure of thermal conductivity and specifies the rate at which heat will transfer through any homogenous material, from one side to the other. If a material has a k value of 1 it means that a 1M cube of this material will transfer heat at a rate of 1 Watt for every degree of temperature difference between opposite faces; 1W/mK
r Value (1/k) Resistivity	r value (thermal resistivity) is the symbol that refers to the materials thickness and by definition is the reciprocal of thermal conductivity - k value.
R value (m² KW) Thermal Resistance	This is the measure of a building materials thermal resistance per m² at a given thickness to resist heat flow through that material
U value (W/m² K) The U value is a measure of thermal transmittance through a building assembly	The U value is similar to the k value. It is a measure of the quantity of heat that will flow through 1m² of the buildings; roof, ceiling, floor or walls each hour when there is a 1K temperature difference from the hot side to the cold side. The value of U is measured in watts, W/m² K. The U value will depend on the R or k value of the building products used (including surface air films and air spaces) to construct the; roof, ceiling, floor and walls. A low U value will mean reduced running costs for heating and cooling due to a high level of thermal insulation.
Total R Value (Rt) Total Thermal Resistance	The R values for each component of a building system can be added together to reach a total thermal resistance for an assembled building element on completion; Rt. The reciprocal of Rt will provide a U value that is used by mechanical service engineers to design efficient heating and cooling equipment appropriate for a given design.
Specific Heat Capacity (J/kgK) (Thermal Mass)	Specific heat capacity (C_p) is a measure of the amount of thermal energy required to raise 1kg of a material by 1 DegC. This is commonly used as a measure of the "thermal capacitance" or "thermal mass" of a material. Thermal mass in building elements provides an inertia against temperature fluctuations. The correct use of thermal mass in building design will even out daily fluctuations in climates with high diurnal temperature differences.
Outdoor Air Film	Layer of air adjacent to the external surface of the building element
Non Ventilated Air Space	Air space enclosed by non permeable building materials
Reflective Air Space	Air space between the Durra Panel Ceiling and roof bounded by reflective insulation under roofing material

Section 3

Durra Steel Sections

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NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Introduction

Background

Keeping pace with the demands of an ever expanding building industry, Ortech Industries produce a wide range of high quality cold rolled galvanised steel profiles that are used to support Durra Panel in Roof, Ceiling, Floor and Wall systems - Durra Building Systems.

Versatile in application, Durra Steel Sections are available according to span and general project requirements and are suited to level, curved or raking roof designs. In addition to complete roof, ceiling, floor and wall systems, the sections are suited for use in suspended ceiling systems, and for particular applications as purlins or girts. The combination of Durra Steel Sections and Durra Panel have been incorporated by leading architects, engineers and designers into landmark building projects Australia wide and around the world.

Ortech Industries remains committed to maintaining a position of excellence in the construction industry with over 50 years of extensive research and development in conjunction with Australia's Commonwealth Scientific and Industrial Research Organisation and Industry experts to deliver the industry benchmark for cutting edge panelised building solutions.

Design Manual Purpose

This Design Manual provides guidance in the Design and Installation of Durra I-Beams and Duplex Beams and other Durra Steel Sections. It has been prepared for Engineers, Architects, Builders, Erectors and other construction personnel for easy steel section selection.

The loading tables are separated into two sections; Part A: A quick reference span chart for approximate section sizing that is not to be used for design purposes and Part B: Limit State Load Capacity Tables that are to be used by Structural Engineers for project design purposes.

Disclaimer

Every care has been made by Ortech Industries to ensure that the information contained within is accurate. Ortech does not take any responsibility for any misuse of their product or any misinterpretation of the information contained within. Ortech Industries recommends that this manual only be used by a qualified expert.



Traditional Construction: Durra Steel Sections in a state of readiness for the installation of Durra Panel. See Section 5 of the Technical Manual for Panelised Modular construction using the Durra Lifting Frame.

Product Overview

Description

Durra Steel Sections have been specifically developed to support Durra Panel in roof, ceiling, wall and flooring applications. The bottom tee flanges of Durra I-Beam and Duplex Beam sections provide support to the machine made long edges of the Durra Panels. Durra cross tee units are bolted between the Durra I-Beam and Duplex Beam sections to form the Durra panel to panel joints in a uniform grid (See Ref Page 1.4.1). Durra I-Beam and Duplex Beam webs are punched with slotted holes for Durra Panel Wedges spaced at nominal 450mm centres. The wedge slot height can be varied to suit the various thicknesses of Durra Panel. Metal wedges are inserted through these slotted holes in alternating directions to clamp Durra Panel firmly in position on top of the bottom tee flange.

The Durra Sections include Duplex Beams in nominal sizes of 80, 125, 150, 175, 200 and 250 mm high, and I-Beams in nominal sizes of 175, 200, 225, 250, 275, 300, 350 and 400 mm high, with other sections being Angles, Wall Angles, Base Tee (Standard), 60 Base Tee, Top Hat Sections in heights of 20, 30, 40 and 60 mm high, Single Channel 50, 55 and 60, Double Channels 50, 55 and 60 mm.

Material Specification

Durra Steel Sections are manufactured at Ortech Industries Bendigo Manufacturing plant from high quality Australian made galvanised steel strips with a zinc coating of Z275 gm/m² which is cold roll formed. This coating ensures adequate protection in a non aggressive environment. Where Durra Steel Sections are exposed to an aggressive external/internal environment, please contact Ortech Industries for further information in relation to protective coatings.

Durra I-Beam and Duplex Beam tee flanges are rolled from 1.5mm thickness material. The standard web thickness for Durra I-Beam and Duplex Beam is 1.9mm. Durra 350 and 400 I-Beams are available in a High Span (HS) version with 2.4mm web, all conforming with AS 1397. Material strength = G300 - Minimum 300 MPa Yield Strength.

Be sure to avoid contact with incompatible materials in accordance with standard industry practice.

Dimensions And Section Properties

Dimensions and sectional properties of individual sections are shown on the relevant reference sheets in this section.

Manufacturing Tolerances

Actual dimensions of individual sections are shown on the relevant reference sheets in this section. Measurement tolerances for the I-Beam and Duplex Beam profiles are as follows:

- Length = +/- 2mm
- Height = +/- 2mm
- Hole Centres = +/- 1mm
- Tee Flanges = +0/- 0.5mm

Bolt And Hole Information

Fixing To Steel

Standard holes are punched in both ends of the I-Beams and Duplex Beams, an 18mm x 22mm slotted hole for a cleated connection to structural steel. It is the responsibility of the Structural Engineer to determine what type and size of bolts will be required for this connection in accordance with local conditions.

For guidance purposes only (not for design) the bolts adopted for I-Beam and Duplex Beam sections less than 300mm are 2/M12 4.6/S bolts, and for sections 300mm or greater M16 4.6/S bolts are required. The bolts and nuts must have integral washers.

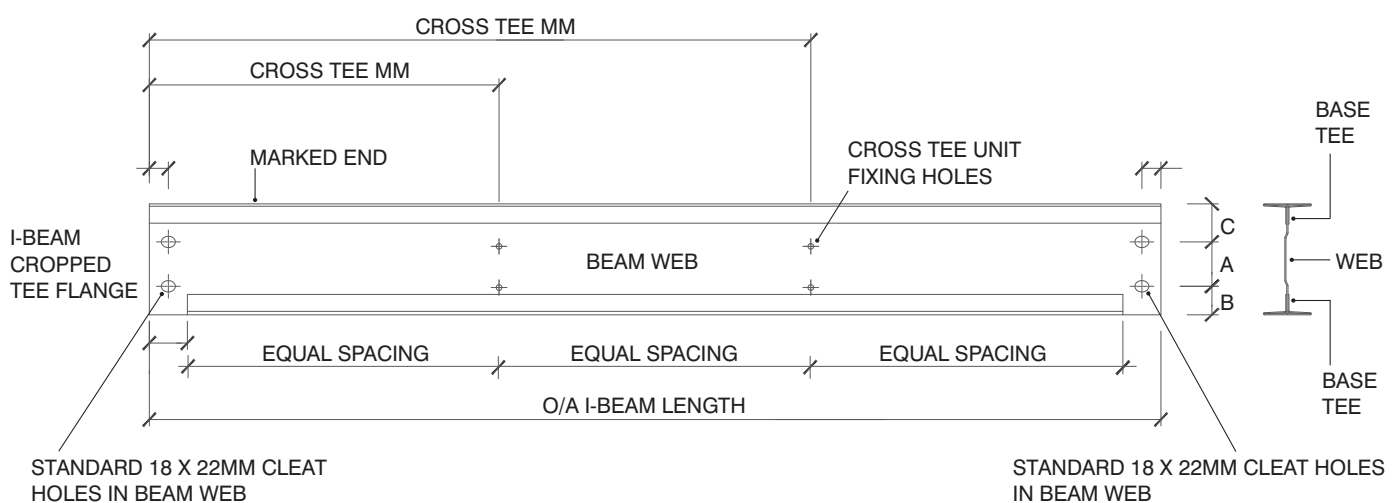
Typical steel cleat connection details for the complete range of Durra Sections are provided on Reference Sheet 3.4.3.

Fixing To Timber

Durra Steel Sections can be connected over or between timber fixing grounds by using a combination of coach screws, bolts and angle end brackets. Typical connection details are provided on Reference Sheet 8.1.3.

Ordering

Durra Steel Sections are custom produced to suit project requirements. Orders should include Durra I Beam and Duplex Beam shop drawings and state clearly — the section profile type, size, length, hole punching for cleated connections, tee unit location, wedge slot height, the quantities required of each length, special applied finishes (if any) together with clear pick-up / delivery instructions (Refer to 9.3.1 - 9.3.6). Tee Unit bridging members that suit the standard 1200mm grid do not require shop drawings. Non standard Tee Unit bridging members require shop drawing details for production.



TYPICAL SHOP DRAWING
DURRA I-BEAM STANDARD CLEAT CONNECTION DETAIL REF 3.4.3
EXAMPLE ONLY BASED ON 6M LONG BEAM

General Recommendations: Handling

Delivery And Storage On Site

- Durra Steel Section are delivered to site in strapped bundles for crane or forklift unloading. The size and marking of packs may be varied to suit project requirements and site conditions.
- If materials are to be stored on site prior to use, packs of steel should be placed neatly off ground on timber gluts in such a way to enable water run off. Durra Steel Sections should not be left out exposed in the open for extended periods of time.
- Durra Steel Sections may be ordered with pre finished painted tee flanges. Care must be taken to avoid damaging these surfaces when using lifting equipment and during the installation process. Chains must not be used when handling Durra Steel Sections.
- Damaged or defective Durra Steel Sections must not be installed and must be replaced prior to installation.

Material Length

Durra Steel Sections are provided custom cut to length. Please note that for lengths over 12M special transport conditions, material packing and site handling arrangements will apply. Contact Ortech Industries for further information.

Cutting Durra Steel Sections

On-site cutting of sections, if required, is easily achieved using a power saw with cutting disc attachment, or with a hack saw on smaller sections.

Painting

Durra Steel Sections can be supplied with a high-quality powder-coat finish to the exposed area of the bottom tee flange. Contact Ortech Industries for lead time and colour availability. The zinc coated surface of the steel section can be easily and satisfactorily painted providing the technique used is compatible with the zinc surface.

Recommended steps for painting:

- Clean and remove all oil and grease
- Apply one coat of etch primer and undercoat
- Use proprietary brand paint for the final coat

Note: For use in areas with severe corrosive environments, Durra Steel Sections can be supplied with high performance epoxy coatings to suit the buildings required design life to first maintenance.

Weathering

Durra Steel Sections are manufactured from galvanised steel and may be left on site exposed to weather providing normal precautions for galvanised materials are observed.

Design Criteria

Durra cold formed galvanised steel sections have been designed to support the complete Durra Panel roof/ceiling, wall system and flooring. Durra Steel Sections are generally attached to the structural steelwork with a purlin cleat bolted connection in simple span. Durra Steel Sections are generally supplied with standard 18mm x 22mm holes punched in accordance with typical cleat detail drawing; see reference sheet 3.4.3.

1. Material Standards

The Durra Steel Sections provided in this section have been developed and certified in accordance with the following standards:

- AS/NZ4600: – Cold Formed Steel Structures Code
- AS/NZ4100: – Steel Structures Code
- AS/NZ 1170.0 – Structural Design Actions : Design Principles
- AS/NZ1170.1 – Structural Design Actions : Permanent Imposed and Other Actions
- AS/NZ1170.2 – Structural Design Actions : Wind Actions

2. All sections at 1200mm centres.

3. All information is based on Limit State Loading.

4. Lateral Restraint

All Duplex and I-Beams are designed with both flanges laterally restrained – Top flange restraint from roof sheeting and bottom flange restraint from Durra Panel system. Span tables do provide guidance on lateral restraint information. Refer to page 3.3.7 for methods of connection to flanges to obtain appropriate lateral restraint.

5. Self Weight

The Design Limit State Load Capacity Tables (Category 2) make no allowance for self weight of the beam or any other materials or elements. It is the responsibility of the engineer to account for all actions in obtaining the applied loading.

6. The loads per metre noted in the Limit State Load Capacity Tables are total loads, therefore the designer must make allowance to include for self weight of the complete system when selecting the appropriate Durra Steel Section for use.

7. Span Types:

Single Spans

The spans given for single spans is the centre – centre distance between supports

Cantilever Spans

Cantilever spans are given assuming that a single end span is provided with the cantilever. The end span is to be at least 2 times greater than the cantilever span.

Continuous Spans

For extreme load conditions, Durra Steel Sections installed in simple span may be spliced together over the purlin cleat to create a continuous span situation. Contact Ortech Industries for splice plate connection details; see reference sheet 3.6.3.

8. The span and load capacity tables assume both loads up or down are acting over the top flange of the steel section with no load supported from the bottom flange.
9. Deflection
All tables assume a deflection limit of span/250. It is to be the judgement of the engineer to check the specific requirements of the project and ascertain what a suitable deflection limit is.
10. Local Pressure Effects
All tables make no allowance for local pressure effects.
11. Span Reduction due to Inclined Beam
Due to the inclination of the beam, there will be a reduction in the design capacity of the section. See reference sheet 3.3.7; Span Reduction for Inclined Beams.
12. Point loading
 - (a) Maximum point load that can be connected to the bottom flange of Durra Steel Sections is 0.6Kn - 60kg per LM. Refer to load capacity span tables to select appropriate steel section that will support required extra loads.
 - (b) Point loads can be converted to uniformly distributed loads and applied over the length of the section. See reference sheet 3.1.7 ; Point loading.
13. Linear interpolation is permitted.
14. Assumptions
The compression flange of the section is held in position to prevent lateral buckling of the section.
 - (a) Sections are to be adequately anchored against wind uplift.
 - (b) Beam Rivet(s) to be located directly above tie down points.
 - (c) Span tables assume the web of the section is in the vertical plane.

Note

It is recommended that if in any doubt about the required actual design condition - consult your Engineer or Ortech Industries.

It is recommended that you consult your project Engineer for all non-standard product applications including any point loading of Durra Steel Section flanges.

Point Loading

There is often a requirement to support services from the bottom flange of Durra Steel Sections; (I-Beam and Duplex Beam profiles). Cross tee units are not to be used for point loading. The safe loads provided in the load capacity tables are in essence, uniformly distributed along the length of the steel section.

Point loads (P) can be converted to uniformly distributed loads (w) and applied along the length of steel section (L) supported in simple span. The table below includes the conversion formulae for converting symmetrically spaced point loads to equivalent uniformly distributed loads.

Conversion Formulae For Point Loads To Uniform Loads

Simple Span Load Condition

1 Load $w = \frac{2P}{L}$

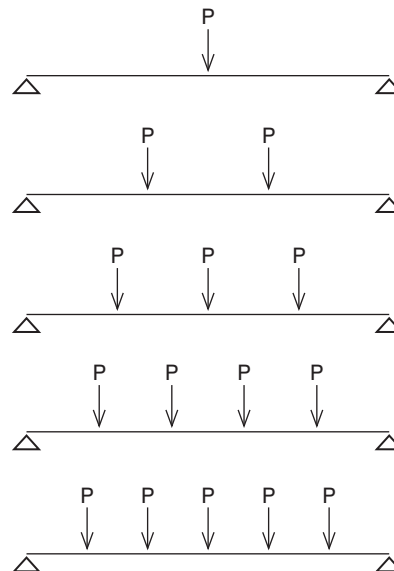
2 Loads $w = \frac{2.67P}{L}$

3 Loads $w = \frac{4P}{L}$

4 Loads $w = \frac{4.80P}{L}$

5 Loads $w = \frac{6P}{L}$

Illustration



P = Point load (kN)

L = Length of span (m)

w = Uniformly distributed load equivalent (kN/m)

Note:

- Maximum point load that can be connected to the bottom flange of Durra Steel Sections is 0.6kN - 60kg per LM. Refer to load capacity span tables to select appropriate steel section that will support required extra loads. See reference sheet 3.3.3
- Point loads can be converted to uniformly distributed loads and applied over the length of the section.
- Universal Support Brackets (USB's) are available to mechanically support point loads from the bottom tee flange of I-Beam and Duplex Beam profiles - See reference sheet 3.5.12

Guidance for Design: Durra Steel Sections with Durra Panels on Sloping Roofs and Vertical Walls.

The Durra Panel System is suitable for use on flat, curved, sloping roofs, and vertical walls. When there is a slope, the designer and erector need to consider the resolution of down slope gravity load forces across the Durra Steel Sections (I Beams and Duplex Beams) in the plane of the panels. If no provision is made for horizontal forces, the purlins and girts may develop a sweep with mid-span sagging down the slope. Following are notes to guide both the structural engineer and the erector.

1. The guidance is directed specifically for I-Beams with single layer Panels. For Durra Duplex Beams with single layer Panels, reduce the limits by 10%.

No strengthening is required if:

- Flat roof
- Roof with 1° slope (1:50) – up to 12m span
- Roof with 3° slope (1:20) – up to 10m span
- Roof with 5° slope (1:10) – up to 8m span

These limits are based on a sweep deflection limit of Span/150, assuming no benefit from panel wedging into the grid to make a composite beam.

2. The strengthening required for roofs varies with the application:
 - The preferred method is to provide support to the lowest roof purlin at the point of each Tee Unit along the eave line from a structural steel element, an Eaves Strut. This Eave Strut should be sized to be strong enough to resist the full component of the roof weight down the slope, as a permanent load in combination with other forces on the Eaves Strut. See Reference 3.1.9. Figure 1.
 - There is an alternative of adding bracing straps (builder's strap complete with tensioners, mild steel strap or threaded rod) diagonally accross / between purlins, to make the purlins into a "truss". See Reference 3.1.9: Figure 2.
3. For Vertical Walls, support the lowest girt off the floor slab with load bearing packers at the point of each Tee Unit. If the lowest purlin is clear of the ground, a suitable lintel is required. This lintel would typically be below the lowest wall girt, or tucked into the web of the second lowest wall girt. See Reference 3.1.10. Figure 3.
4. On Vertical Walls without lintels or base support, diagonal tension bracing will be required; builders strap with tensioners, mild steel strap or threaded rod. See Reference 3.1.10. Figure 4.

Roof Applications

Figure 1:

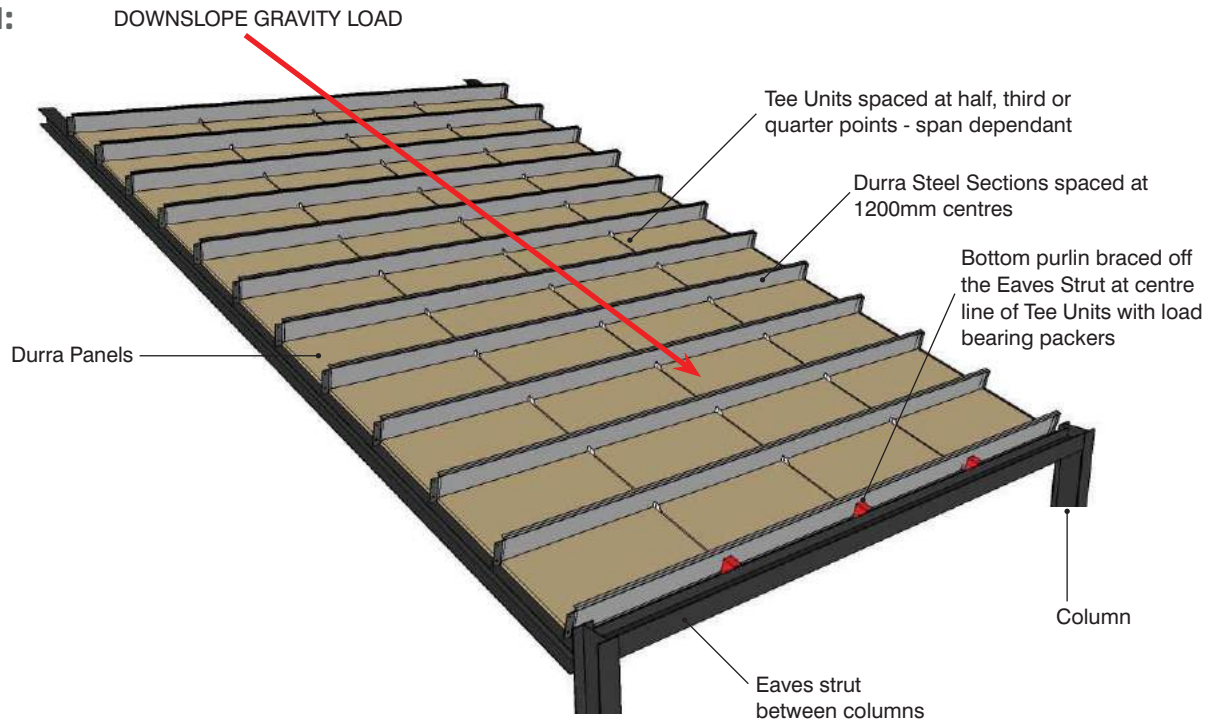
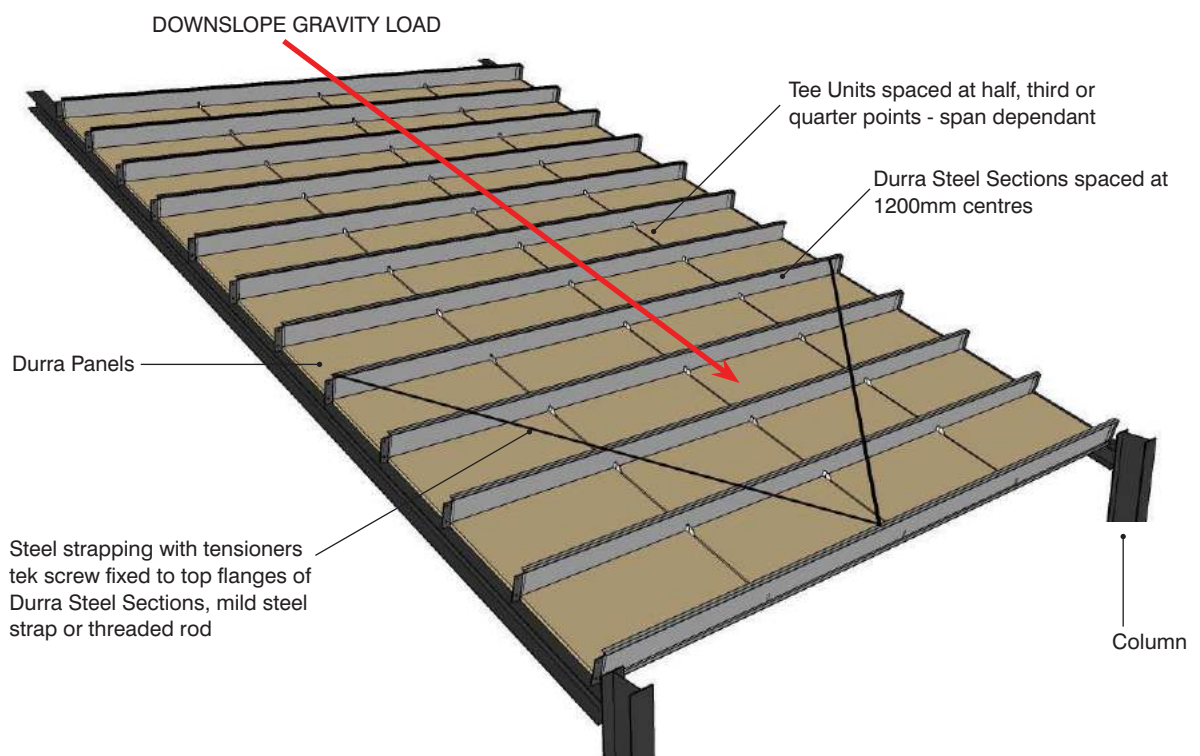


Figure 2:



Wall Applications

Figure 3:

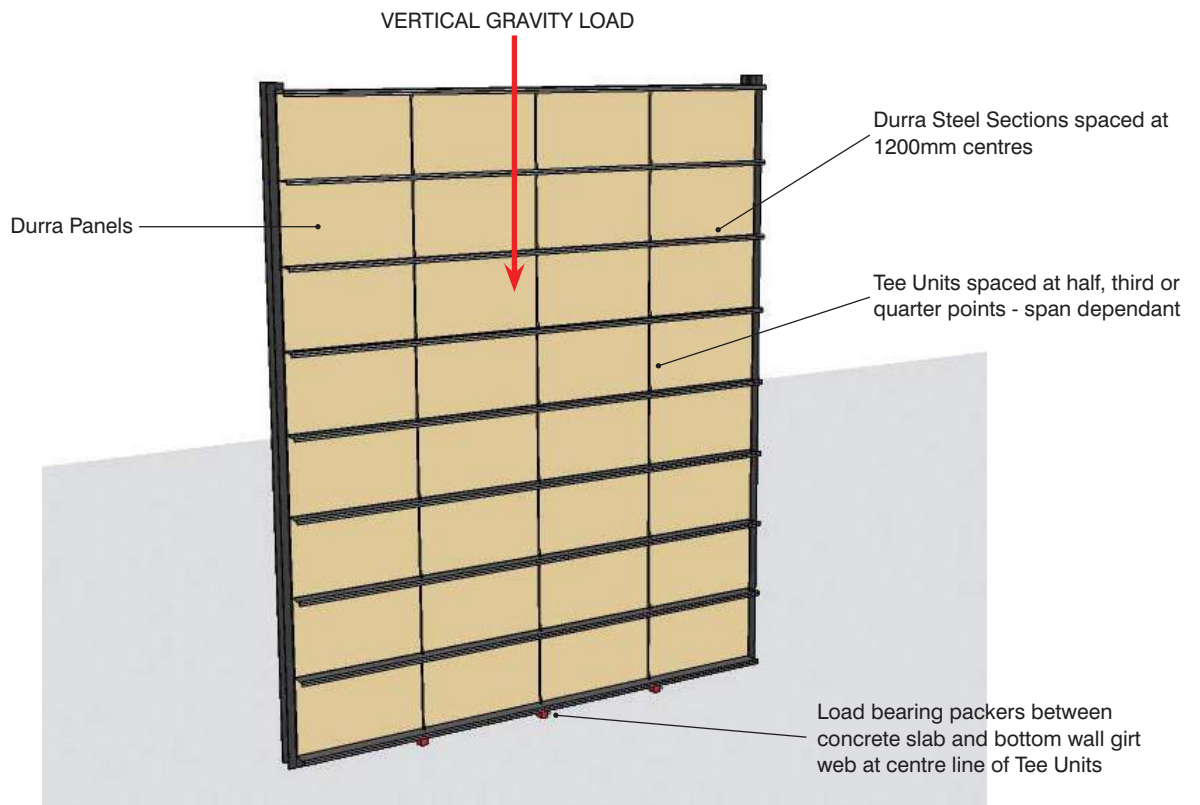
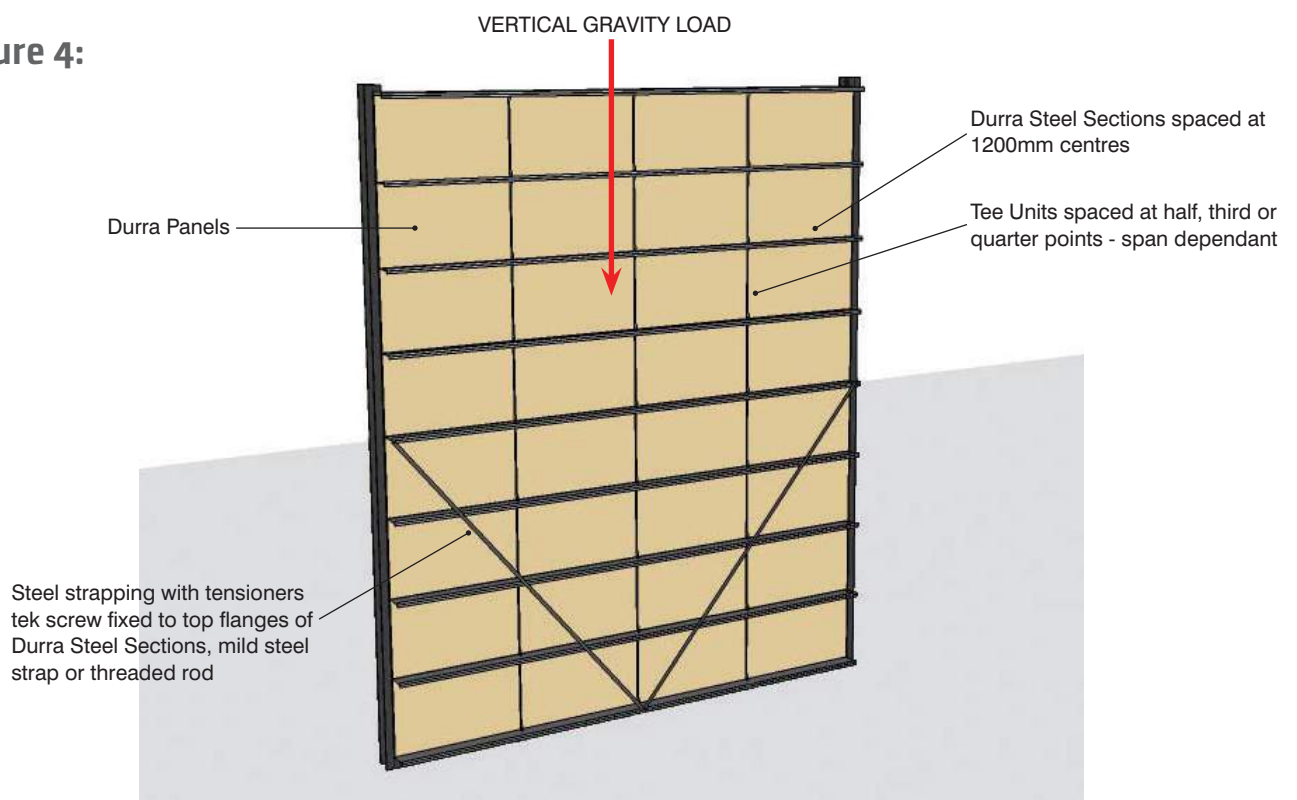
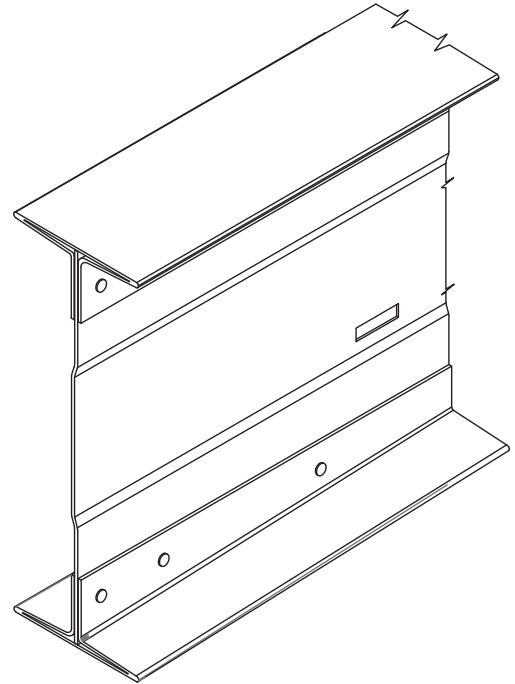
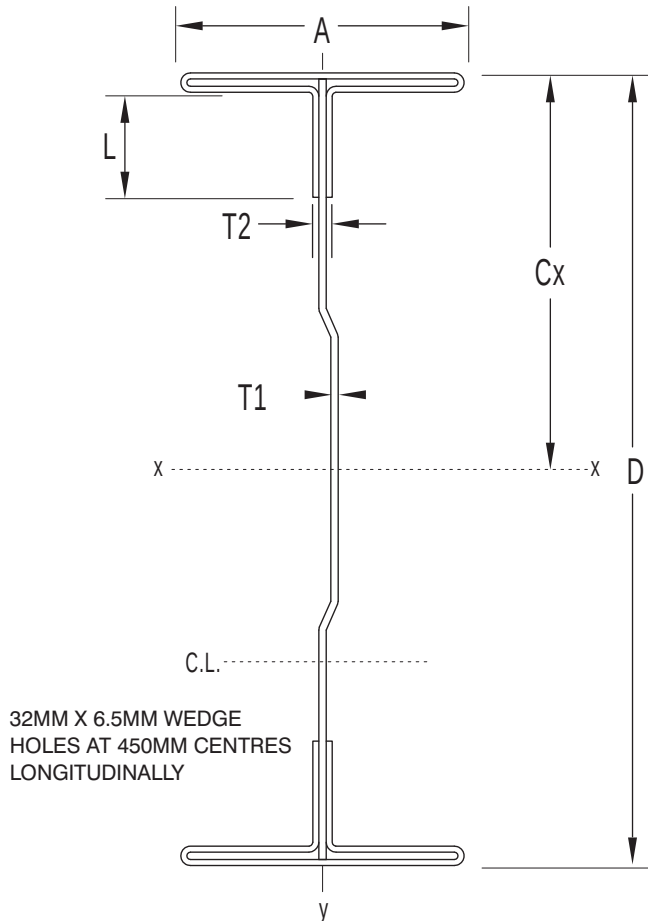


Figure 4:



Dimensions And Section Properties

I-Beam



Dimensions

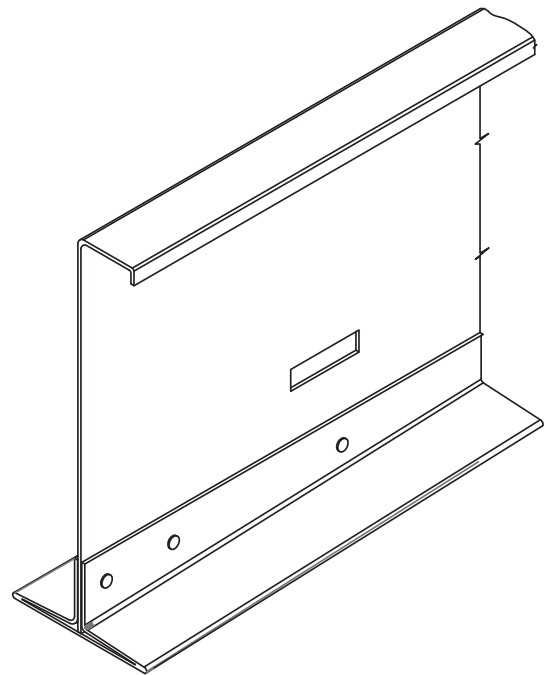
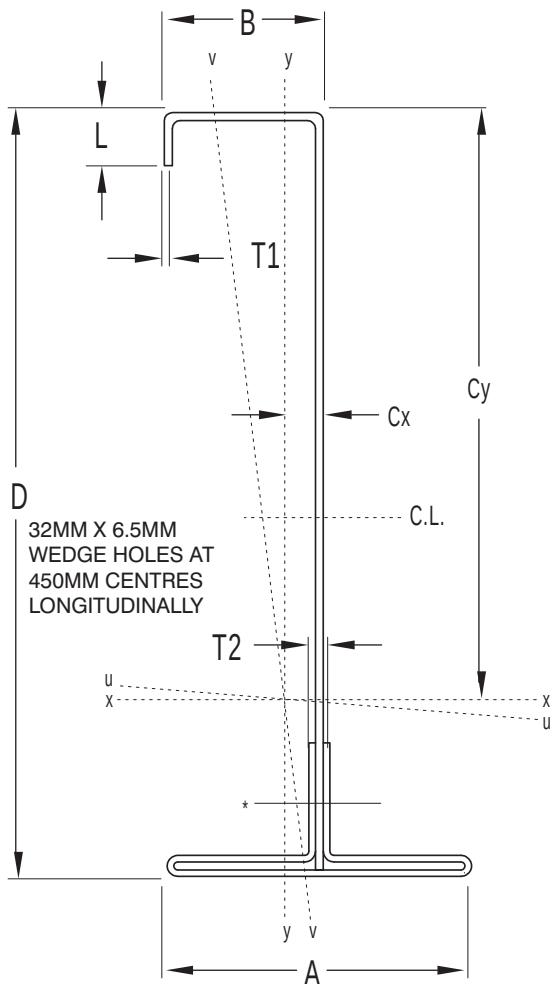
SECTION	A	D	Cx	L	T1	T2
175 I-BEAM	76.2	174	87.33	25.4	1.9	5.1
225 I-BEAM	76.2	224	112.73	25.4	1.9	5.1
200 I-BEAM	76.2	204	102	25.4	1.9	5.1
250 I-BEAM	76.2	254	127	25.4	1.9	5.1
300 I-BEAM	76.2	300	150	25.4	1.9	5.1
350 I-BEAM	76.2	350	175	25.4	1.9	5.1
350 HS I-BEAM	76.2	350	175	25.4	2.4	5.6
400 HS I-BEAM	76.2	400	200	25.4	2.4	5.6

I-Beam Section Properties

I-BEAM	MOMENT OF INERTIA (10 ⁶ mm ⁴)		MODULUS OF SECTION (mm ³)		RADIUS OF GYRATION (mm)		CROSS SECTION AREA (mm ²)	WEIGHT
	I _{xx}	I _{yy}	Z _{xx}	Z _{yy}	r _{xx}	r _{yy}	A	Kg / per LM
175 I-BEAM	4.810	.207	55297	5440	71.5	14.8	941	7.36
200 I-BEAM	6.929	.207	67933	5440	83.3	14.4	998	7.81
225 I-BEAM	8.589	.207	76690	5440	91.0	14.1	1036	8.14
250 I-BEAM	11.470	.207	90320	5440	102.4	13.8	1093	8.59
300 I-BEAM	16.853	.207	112355	5440	119.5	13.2	1181	9.49
350 I-BEAM	24.123	.207	137747	5440	137.5	12.7	1276	10.39
350 HS I-BEAM	25.863	.207	147790	5447	133.6	12.0	1449	11.38
400 HS I-BEAM	35.594	.207	177972	5447	150.6	11.5	1569	12.32

Dimensions And Section Properties

Duplex Beam



Dimensions

SECTION	A	B	D	L	T1	T2
80 DUPLEX BEAM	76.2	38.1	87	12.7	1.9	5.1
125 DUPLEX BEAM	76.2	38.1	132	12.7	1.9	5.1
150 DUPLEX BEAM	76.2	38.1	149	12.7	1.9	5.1
175 DUPLEX BEAM	76.2	38.1	183	12.7	1.9	5.1
200 DUPLEX BEAM	76.2	38.1	200	12.7	1.9	5.1
250 DUPLEX BEAM	76.2	38.1	250	12.7	1.9	5.1

Duplex Beam Section Properties

DUPLEX BEAM	MOMENT OF INERTIA (10 ⁶ mm ⁴)		CENTRE OF GRAVITY (mm)		MODULUS OF SECTION (mm ³)	RADIUS OF GYRATION (mm)		CROSS SECTION AREA (mm ²)	WEIGHT
	Ixx	Iyy	Cx	Cy	Zxx	rx	ry	A	Kg / per LM
80 DUPLEX BEAM	.494	.169	3.73	53.23	9280	30	17.6	549	4.79
125 DUPLEX BEAM	1.636	.171	3.33	84.6	19340	49.8	16.2	658	5
150 DUPLEX BEAM	2.143	.172	3.12	93.7	22950	55.4	15.7	697	5.21
175 DUPLEX BEAM	3.758	.172	2.84	114.6	32780	69.9	15	768	5.76
200 DUPLEX BEAM	4.682	.172	2.65	124.6	37576	76.5	14.6	797	5.85
250 DUPLEX BEAM	7.463	.172	2.35	154.6	48269	92.5	14.1	872	6.49

Span Guidance Tables - Part A

Durra I-Beams

Durra Duplex Beams

This section of the manual provides sample span tables based on a Category 3 level of exposure for Regions; A, B, and C. The tables indicate for guidance purposes only the recommended maximum span and cantilever overhang for Durra Steel Sections as a simply supported beam spaced at 1200mm centres carrying Durra Panel and metal deck roofing.

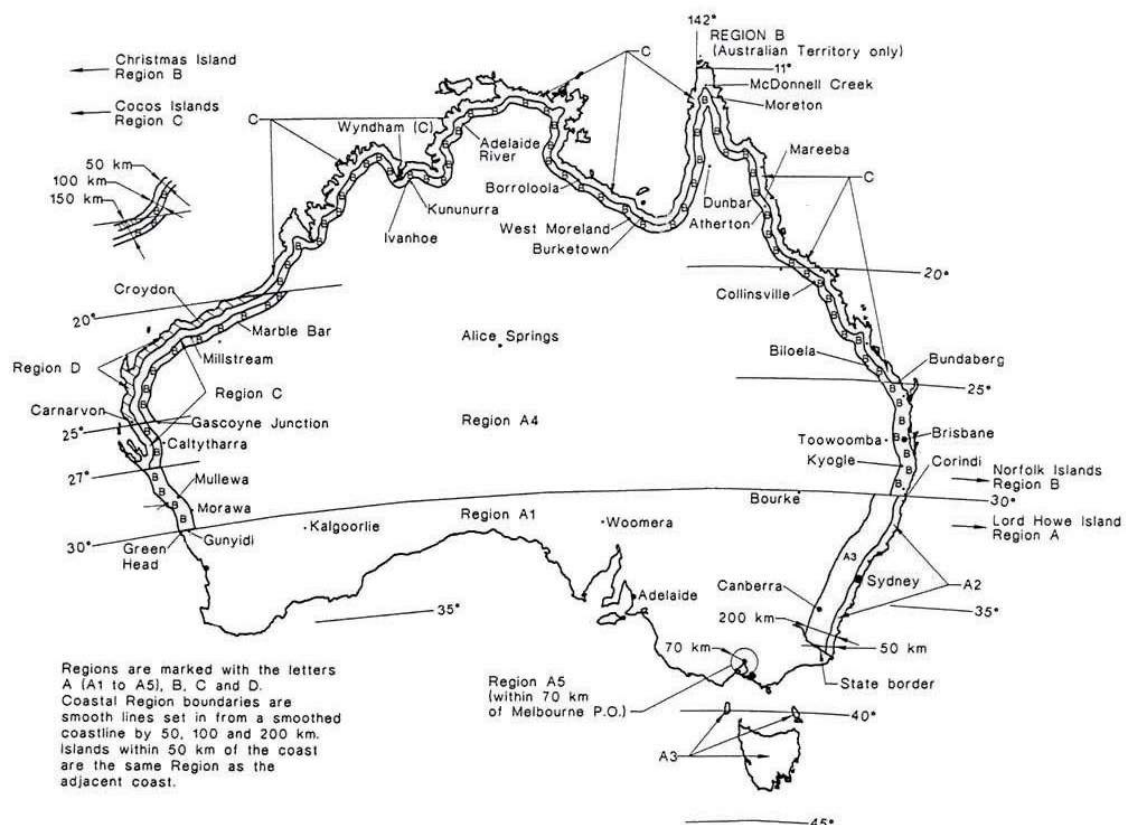
This information is based on the following assumptions:

- Durra Steel Sections spaced at 1200mm centres
- Durra Steel Sections supporting Durra Panel and 0.48mm B.M.T Metal Deck Roof and Graded Battens
- Terrain Category 3. (Suburban areas)
- External Pressure Co-efficient C_{pe} -0.9
- Internal Pressure Co-efficient C_{pi} +0.3
- Building height 10m max
- Top and bottom flanges laterally restrained
- No allowance for span reduction due to inclined beams

GUIDE ONLY, NOT TO BE USED FOR STRUCTURAL DESIGN

Regions For Wind Loading

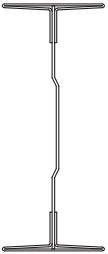
Below is a diagram showing the different regions within Australia relevant for wind loading



Span Guidance Table - Part A

Durra I-Beams

Durra Duplex Beams

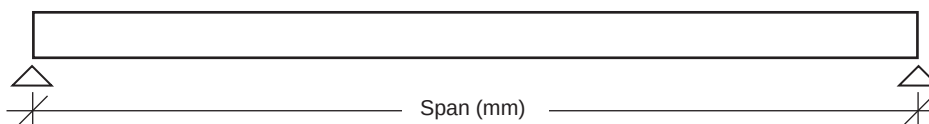
SECTION	PROFILE	DURRA PANEL / CEILING SYSTEM - SIMPLY SUPPORTED					
Type of system		Span (metres) - Durra Steel Section @ maximum 1200mm spacing supporting Durra Panel Metal Deck Roof 0.48mm B.M.T and Graded Purlins					
REGION		REGION A		REGION B		REGION C	
Performance		SPAN	CANTI LEVER	SPAN	CANTI LEVER	SPAN	CANTI LEVER
50 DOUBLE CHANNEL		2300	600	1800	500	1400	300
125 DUPLEX BEAM		4700	1300	3800	1000	3000	800
150 DUPLEX BEAM		5100	1400	4400	1200	3500	900
175 DUPLEX BEAM		6400	1600	5000	1400	4000	1100
200 DUPLEX BEAM		7100	1600	5700	1400	4700	1100
250 DUPLEX BEAM		8200	1700	7500	1500	6000	1200
175 I-BEAM		6700	1800	6000	1600	5000	1400
200 I-BEAM		7100	1900	6300	1700	5400	1500
225 I-BEAM		8300	2300	7400	2000	6000	1600
250 I-BEAM		9500	2600	8200	2200	6700	1700
300 I-BEAM		11,000	2700	9200	2500	7400	2000
350 I-BEAM		11,800	2800	10,200	2600	8200	2200
350 HS I-BEAM		12,000	2800	10,500	2600	9000	2200
400 HS I-BEAM		13,000	2800	11,000	2600	9500	2200

** If any doubt exists as to the correct span for a particular project, consult your engineer or Ortech Industries Pty Ltd.

Limit State Load Capacity Tables - Part B

Durra I-Beam

Simple Spans



SECTION: 175 I-BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	4.4	5.67	4.64
4500	3.4	5.00	3.32
5000	2.7	4.03	2.50
5500	2.3	3.32	1.70
6000	1.8	2.74	1.40
6500	1.6	2.38	1.10
7000	1.4	2.02	0.80
7500	1.1	1.80	0.70

SECTION: 200 I-BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	5.14	6.62	6.20
4500	3.97	5.84	4.43
5000	3.15	4.71	3.34
5500	2.69	3.88	2.27
6000	2.10	3.20	1.87
6500	1.87	2.78	1.47
7000	1.64	2.36	1.07
7500	1.29	2.10	0.93
8000	1.26	1.76	0.77

SECTION: 225 I-BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	6.1	7.86	8.28
4500	4.71	6.93	5.93
5000	3.74	5.59	4.46
5500	3.19	4.60	3.04
6000	2.5	3.80	2.50
6500	2.22	3.30	1.96
7000	1.94	2.80	1.43
7500	1.53	2.50	1.25
8000	1.50	2.09	1.04
8500	1.32	1.90	0.88
9000	1.21	1.71	0.75

SECTION: 250 I-BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	7.17	8.72	10.98
4500	5.54	8.15	7.86
5000	4.4	6.57	5.92
5500	3.75	5.41	4.02
6000	2.93	4.46	3.31
6500	2.61	3.88	2.60
7000	2.28	3.29	1.89
7500	1.79	2.93	1.66
8000	1.55	2.46	1.37
8500	1.42	2.23	1.17
9000	1.30	2.00	0.99
9500	1.17	1.76	0.85
10000	1.04	1.65	0.73

NOTE:

- Tables assume continuous bottom flange restraint being provided by Durra Panel.
- If top flange is restrained by metal deck roofing, then strength in will equal strength out.

3.3.4

Durra Steel Sections

SECTION: 300 I-BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	8.64	12.37	15.64
4500	6.97	9.82	11.19
5000	5.3	7.91	8.43
5500	4.52	6.52	5.73
6000	3.53	5.38	4.72
6500	3.14	4.67	3.71
7000	3.05	3.97	2.70
7500	2.65	3.53	2.36
8000	2.33	2.97	1.95
8500	2.07	2.69	1.66
9000	1.84	2.42	1.42
9500	1.65	2.12	1.21
10000	1.49	1.98	1.04
10500	1.33	1.75	0.88
11000	1.23	1.61	0.74
11500	1.12	1.49	0.71

SECTION: 350 I-BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	8.7	14.46	21.30
4500	7.8	11.48	15.24
5000	6.2	9.25	11.48
5500	5.28	7.62	7.80
6000	4.13	6.29	6.43
6500	3.67	5.46	5.05
7000	3.21	4.64	3.67
7500	3.1	4.13	3.21
8000	2.72	3.47	2.66
8500	2.43	3.14	2.27
9000	2.16	2.82	1.93
9500	1.94	2.48	1.65
10000	1.75	2.32	1.42
10500	1.56	2.04	1.19
11000	1.44	1.88	1.01
11500	1.32	1.74	0.96
12000	1.2	1.58	0.78
12500	1.1	1.47	0.73

SECTION: 350 I-BEAM HIGH SPAN 2.4 WEB (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	11.36	12.91	23.95
4500	8.78	11.65	17.14
5000	6.97	10.40	12.90
5500	5.94	8.57	8.77
6000	4.65	7.07	7.23
6500	4.13	6.14	5.68
7000	3.61	5.22	4.13
7500	3.49	4.65	3.61
8000	3.06	3.90	2.99
8500	2.73	3.54	2.55
9000	2.43	3.18	2.17
9500	2.18	2.79	1.86
10000	1.96	2.61	1.60
10500	1.75	2.30	1.34
11000	1.62	2.12	1.14
11500	1.48	1.96	1.08
12000	1.35	1.78	0.88
12500	1.24	1.65	0.83
13000	1.17	1.52	0.70
13500	1.08	1.35	0.61

SECTION: 400 I-BEAM 2.4 WEB (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	13.67	15.53	32.95
4500	10.56	14	23.57
5000	8.39	12.52	17.75
5500	7.14	10.31	12.07
6000	5.59	8.51	9.94
6500	4.97	7.39	7.81
7000	4.35	6.27	5.68
7500	3.42	5.59	4.97
8000	3.35	4.69	4.12
8500	3.2	4.26	3.51
9000	2.91	3.82	2.98
9500	2.61	3.35	2.56
10000	2.36	3.14	2.20
10500	2.10	2.76	1.85
11000	1.95	2.55	1.56
11500	1.77	2.36	1.49
12000	1.62	2.14	1.21
12500	1.49	1.99	1.14
13000	1.4	1.83	0.96
13500	1.29	1.68	0.84
14000	1.19	1.55	0.78

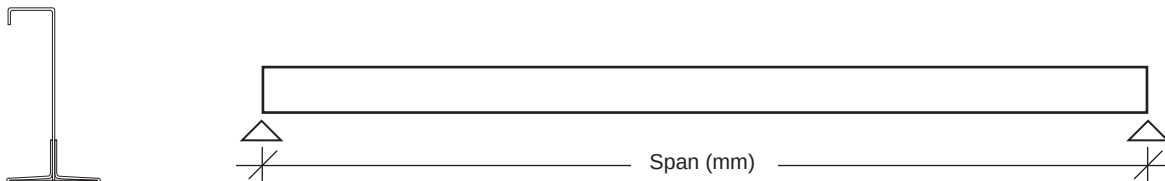
NOTE:

- Tables assume continuous bottom flange restraint being provided by Durra Panel.
- If top flange is restrained by metal deck roofing, then strength in will equal strength out.

Limit State Load Capacity Tables - Part B

Durra Duplex Beam

Simple Spans



SECTION: 80 DUPLEX BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
3000	2.2	4.40	1.12
3500	1.6	3.20	0.70

SECTION: 125 DUPLEX BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
3000	4.58	6.22	3.71
3500	3.33	4.53	2.32
4000	2.61	3.54	1.56
4500	2.06	2.69	1.09
5000	1.67	2.26	0.79

SECTION: 150 DUPLEX BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	2.92	3.95	2.04
4500	2.32	3.2	1.43
5000	1.96	2.65	1.04
5500	1.62	2.18	0.78

SECTION: 175 DUPLEX BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	3.85	5.37	3.58
4500	3.11	4.35	2.51
5000	2.58	3.61	1.83
5500	2.13	2.97	1.37
6000	1.75	2.45	1.07
6500	1.5	2.10	0.84
7000	1.31	1.83	0.67

NOTE:

- Tables assume continuous bottom flange restraint being provided by Durra Panel.
- If top flange is restrained by metal deck roofing, then strength in will equal strength out.

SECTION: 200 DUPLEX BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	4.3	6.01	4.49
4500	3.6	4.87	3.13
5000	2.7	4.03	2.30
5500	2.25	3.32	1.70
6000	1.85	2.74	1.32
6500	1.58	2.34	1.02
7000	1.38	2.05	0.83
7500	1.2	1.79	0.65

SECTION: 250 DUPLEX BEAM (kN/m)

Span	Strength In	Strength Out	Load for deflection
L	kN/m	kN/m	L/250
4000	6.15	7.98	7.15
4500	4.98	6.46	4.99
5000	4.13	5.36	3.67
5500	3.4	4.41	2.71
6000	2.8	3.63	2.11
6500	2.4	3.11	1.63
7000	2.1	2.72	1.33
7500	1.73	2.37	1.03
8000	1.50	2.09	0.88
8500	1.39	1.80	0.73

NOTE:

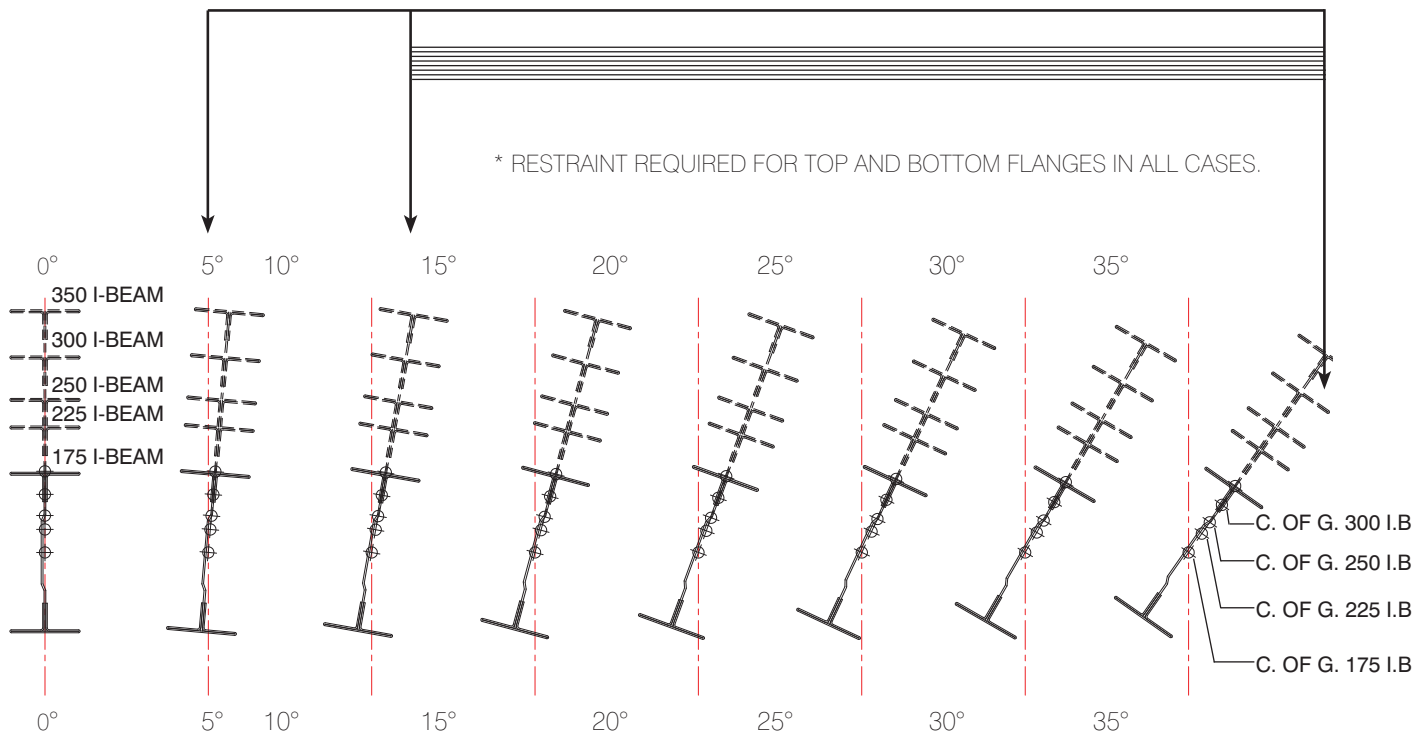
- Tables assume continuous bottom flange restraint being provided by Durra Panel.
- If top flange is restrained by metal deck roofing, then strength in will equal strength out.

Span Reduction For Inclined Beams

Span Reduction For Inclined I Beams

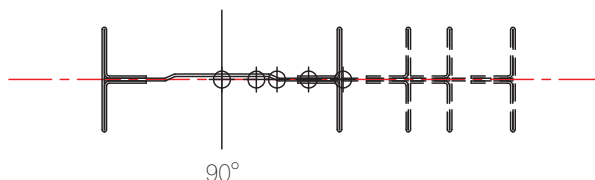
INCLINATION ANGLES WHICH REQUIRE RESTRAINT TO TOP AND BOTTOM FLANGES.

LATERAL RESTRAINT REQUIRED ABOVE 5° INCLINATION



- Bottom flange restraint is by Durra Panel locked in position.
- Options for top flange restraint include; metal roof sheeting, mild steel strap, hoop iron or speed brace.

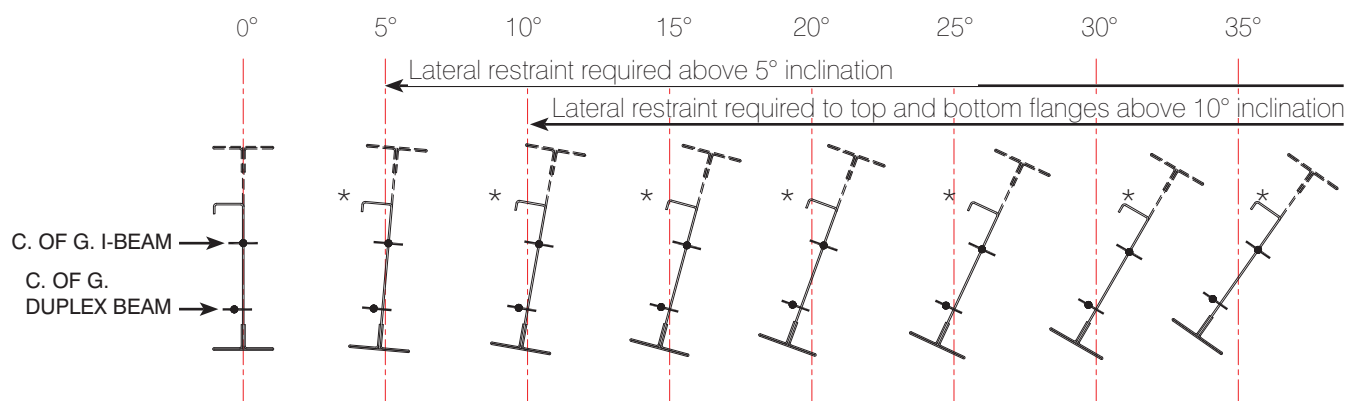
GIRT APPLICATIONS REQUIRE RESTRAINT AT ALL TIMES



Note: Refer to Ortech Industries for typical restraint details.

3.3.8

Durra Steel Sections



* TOP FLANGE OF DUPLEX BEAM MUST POINT UP THE ROOF PITCH

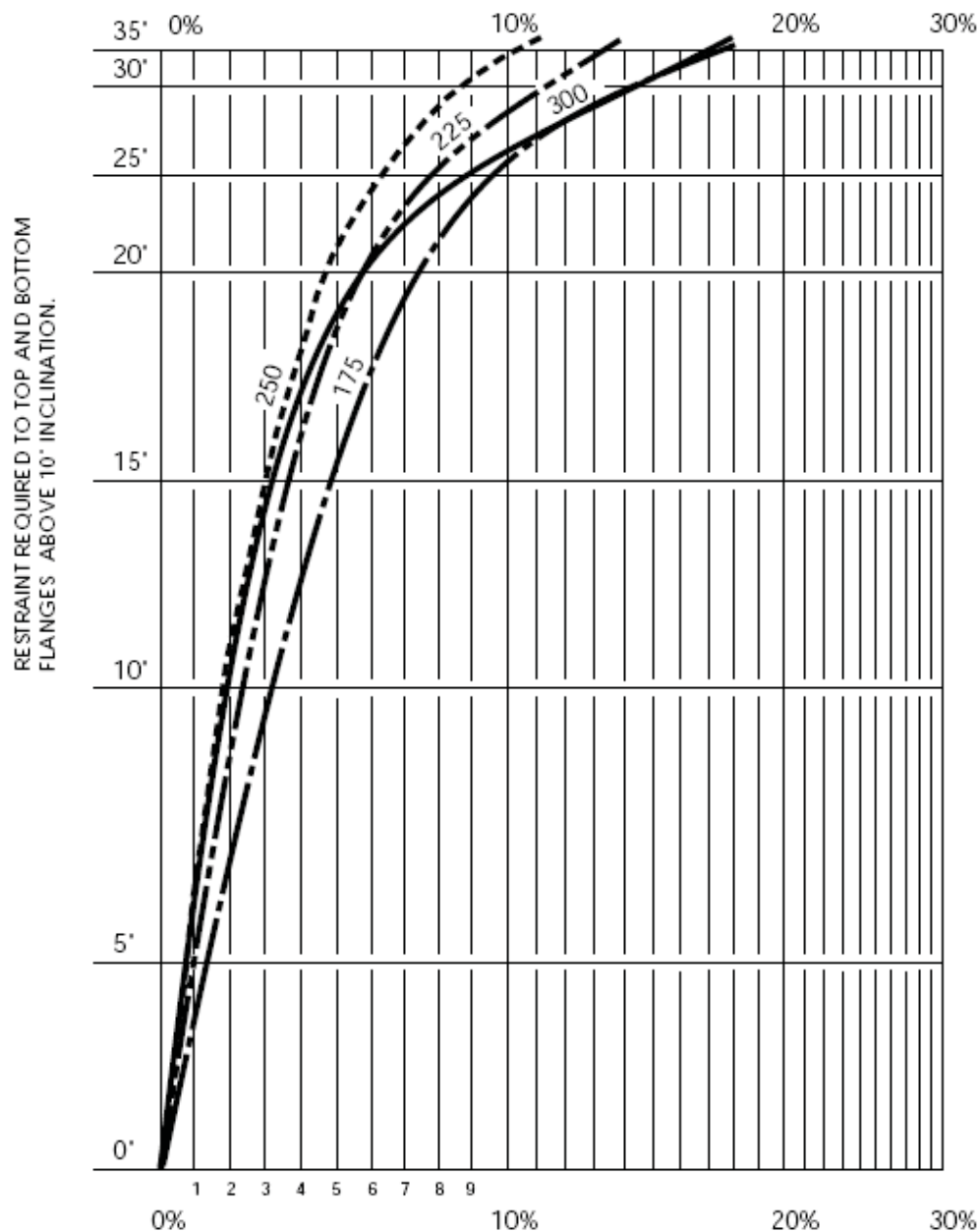
REDUCTION IN SPAN (due to decrease in "Moment of Inertia", as % of allowable span for 0° inclination)

SECTION	5°	10°	15°	20°	25°	30°	35°
80 DUPLEX BEAM	3.0	6.5	10	13	17.5	22.5	28
125 DUPLEX BEAM	2.5	5.5	8.5	11.5	15.5	19.5	24
150 DUPLEX BEAM	2	4	6.5	9	12	15.5	19.5
175 DUPLEX BEAM	1.5	3	5.5	8	10.5	14	17.5
200 DUPLEX BEAM	1	2	4	7	9	12.5	15.5
250 DUPLEX BEAM	1	2	4	7	9	12.5	15.5
175 I-BEAM	1.5	3	5	7	9.5	13	16.5
200 I-BEAM	1	2.5	4.5	6.5	9	12	15
225 I-BEAM	1	2.5	4	6	8	10.5	13
250 I-BEAM	1	2	3	4.5	6.5	9	11
300 I-BEAM	1	2	3	6	9	13	16.5
350 I-BEAM	1	2.5	4.5	6.5	9.5	14	18
350 HS I-BEAM	1	2.5	4.5	6.5	9.5	14	18
400 HS I-BEAM	1	2.5	4.5	6.5	9.5	14	18

I-Beam Span Reduction Graph

Angle Of Inclination

LATERAL RESTRAINT REQUIRED

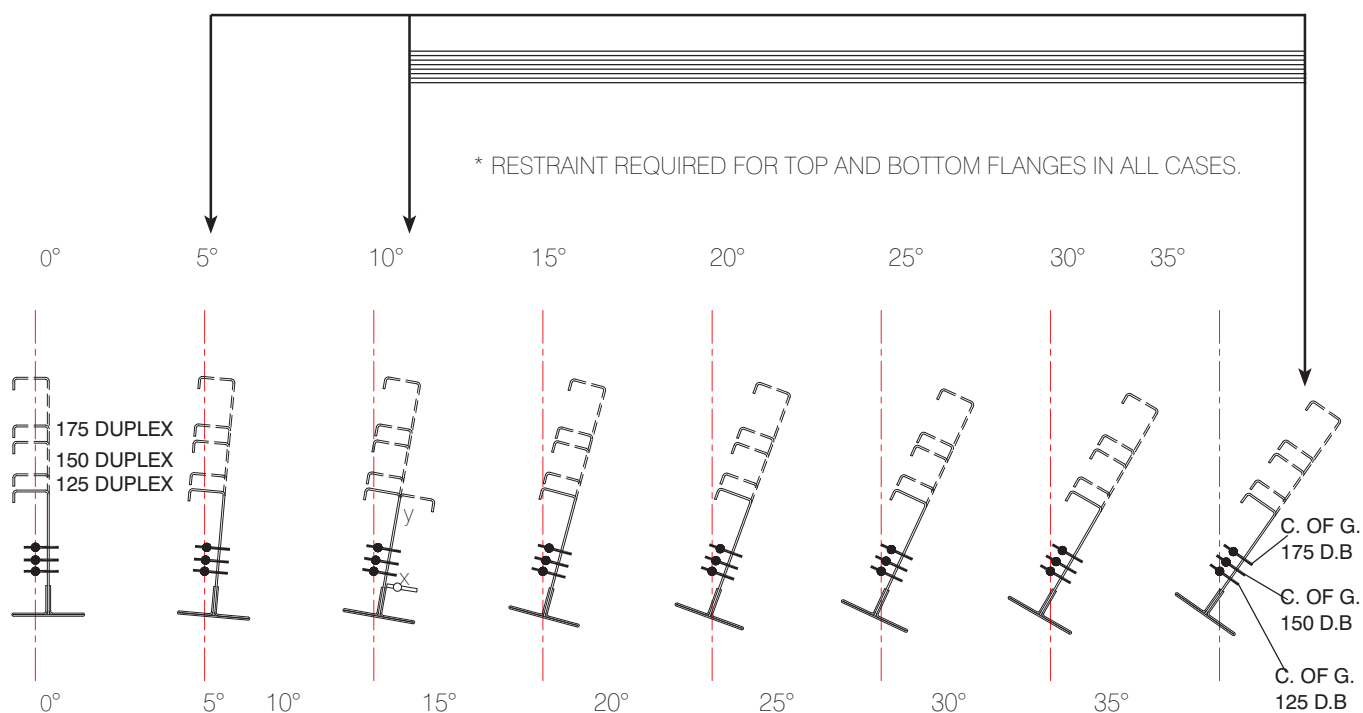


Reduction in span due to decrease in "moment of Inertia" expressed as a percentage of allowable span for 0° inclination.

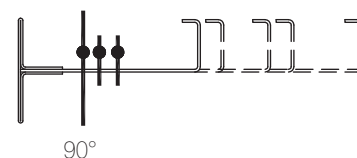
Span Reduction For Inclined Duplex Beams

INCLINATION ANGLES WHICH REQUIRE RESTRAINT TO TOP AND BOTTOM FLANGES.

LATERAL RESTRAINT REQUIRED ABOVE 5 ° INCLINATION



GIRT APPLICATIONS REQUIRE RESTRAINT AT ALL TIMES



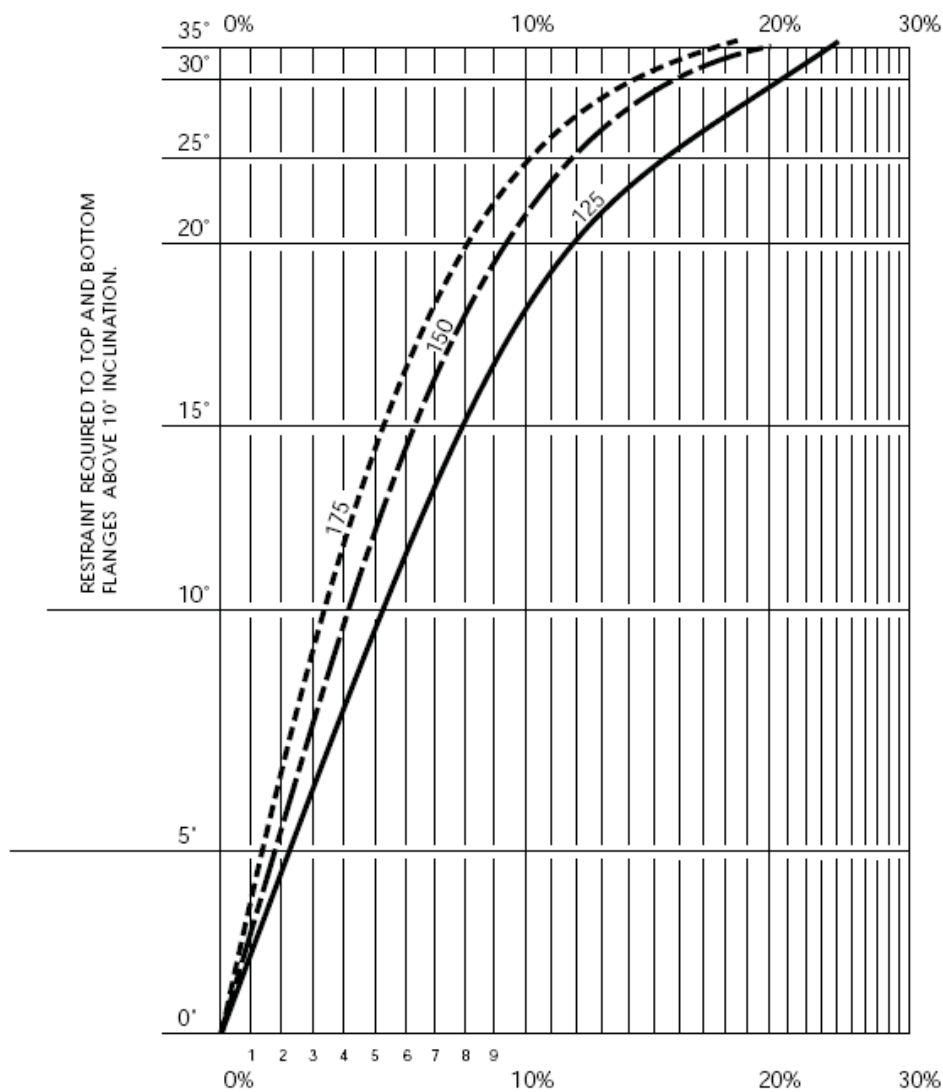
Note:

1. Centre of gravity at 'X' and Flange 'Y' show incorrect application. Top Flange of Duplex Beam MUST point UP the roof pitch.
2. * Refer to Ortech Industries for restraint requirements.

Duplex Beam Span Reduction Graph

Angle Of Inclination

LATERAL RESTRAINT REQUIRED

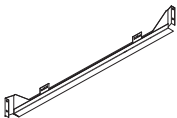


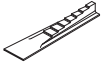
Reduction in span due to decrease in "moment of Inertia" expressed as a percentage of allowable span for 0° inclination.

Quick Reference Chart: Product Weights

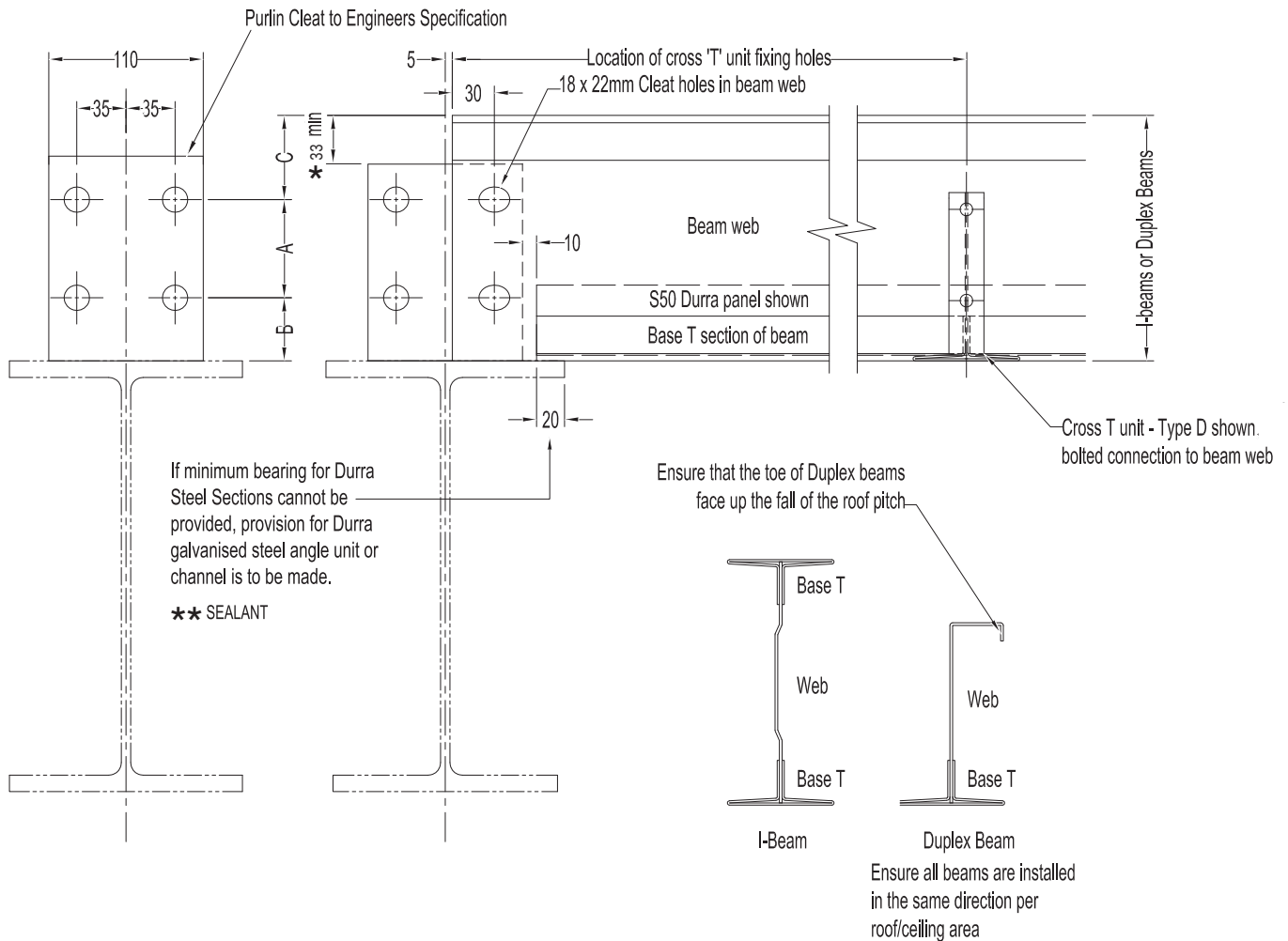
SECTION	PROFILE	Kg / LM (nominal)	LM / tonne	Ref No.
80 DUPLEX BEAM		4.22	237	3.2.3
125 DUPLEX BEAM		5.00	200	3.2.3
150 DUPLEX BEAM		5.21	192	3.2.3
175 DUPLEX BEAM		5.76	174	3.2.3
200 DUPLEX BEAM		5.88	171	3.2.3
250 DUPLEX BEAM		6.49	154	3.2.3
175 I-BEAM		7.36	136	3.2.1
200 I-BEAM		7.81	128	3.2.1
225 I-BEAM		8.14	123	3.2.1
250 I-BEAM		8.59	116	3.2.1
300 I-BEAM		9.49	105	3.2.1
350 I-BEAM		10.39	96	3.2.1
350 HS I-BEAM		11.38	88	3.2.1
400 HS I-BEAM		12.32	81	3.2.1

* Refer Reference Sheet No. 3.2.1 and 3.2.3

TEE UNITS TYPE A & D	PROFILE	KG / EACH (NOMINAL)	LM / TONNE	REF NO.
1200mm grid		3.00	N/A	3.5.2

SECTION	PROFILE	KG / LM (NOMINAL)	LM / TONNE	REF NO.
ANGLE		1.30	770	3.5.7
WALL ANGLE		1.96	510	3.5.7
BASE TEE		2.36	423	3.5.8
60 BASE TEE		2.24	446	3.5.8
50 SINGLE CHANNEL		1.65	606	3.5.10
55 SINGLE CHANNEL		1.65	606	3.5.10
60 SINGLE CHANNEL		1.65	606	3.5.10
50 DOUBLE CHANNEL		3.20	312	3.5.11
55 DOUBLE CHANNEL		3.20	312	3.5.11
60 DOUBLE CHANNEL		3.20	312	3.5.11
TOP HAT 20		1.47	680	3.5.9
TOP HAT 30		1.56	641	3.5.9
TOP HAT 40		1.72	581	3.5.9
TOP HAT 60		1.95	513	3.5.9
UNIVERSAL SUPPORT BRACKET		0.10 Kg / PER PAIR	N/A	3.5.12
WEDGE		0.03 Kg / PER UNIT	N/A	3.5.1

Typical Cleat Connection Detail



Duplex Beams				
Beam Type	Dimensional Information			
	Nominal height (mm)	A	B	C
80	87	-	-	-
125	132	35	45	52
150	149	70	45	34
175	183	70	45	68
200	200	110	45	45
250	250	110	65	75

I Beams				
Beam Type	Dimensional Information			
	Nominal height (mm)	A	B	C
175	174	70	45	59
200	204	80	45	79
225	224	110	45	69
250	254	110	65	79
300	300	170	65	65
350	350	220	65	65
400	400	2 x 110	65	115

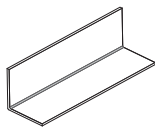
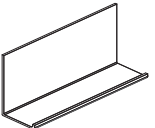
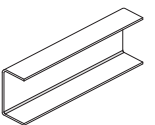
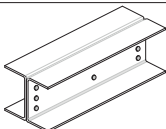
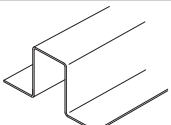
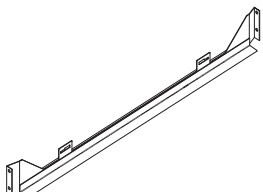
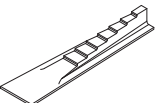
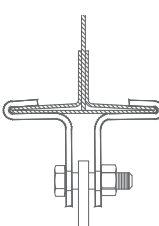
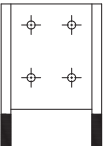
NOTE 1: DIMENSIONAL TOLERANCE IS + OR - 1mm

NOTE 2: DURRA I BEAMS AND DUPLEX BEAMS ARE TYPICALLY PLACED ON THE HIGH SIDE OF PURLIN CLEATS

* DENOTES MINIMUM DIMENSION FOR I BEAMS ONLY

*** SEALANT: FOR ACOUSTIC INSTALLATIONS IT IS RECOMMENDED TO CONSIDER APPLICATION OF A CONTINUOUS BEAD OF CLASS F 25LM SILICONE OR POLYURETHENE SEALANT TO CAULK ANY GAPS BETWEEN DURRA PANEL AND STRUCTURAL STEELWORK. IF IN DOUBT CONSULT THE PROJECT ACOUSTIC ENGINEER

Accessories

ACCESSORY	PROFILE	APPLICATION
ANGLE / ANGLE BRACKET		Used to support edges of Durra Panel around perimeter of ceiling and for supporting graded purlins. 40 x 40 Angle bracket (fixing ground for fascia) may be tek screw fixed or welded to Durra Steel Sections.
WALL ANGLE		Used to support the perimeter of Durra Panel against a rising wall. <i>*Not to be used as a structural supporting member for roof beams.</i>
SINGLE CHANNEL		Used to support the ends of Durra Panel when there is no bearing support available.
DOUBLE CHANNEL		Used as a vertical stud to connect Durra Panel in a demountable wall system.
TOP HAT		General purpose top hat for fixing metal roofing. It can also be used as a cover strap clamp when fixing Durra Panel back to framing or to the underside of a ceiling framework.
TEE UNIT BRIDGING		Cross Tee Units fit between the Durra Steel Sections and are fixed into position with a bolted connection. The tee units are used to form the Durra Panel to panel end joint and also act as a bridging member. Cross Tee Units have the same 76mm wide tee flange as the Durra Steel Sections and are available in length to suit the standard 1200mm grid complete with end fixing brackets. Note: Tee Units are available in sizes to suit non-standard grid widths of less than 1200mm centres. <i>*Tee Units are not to be used for the support of building services.</i> <i>*Durra Panel must not be walked on until Tee Units have been bolted into position.</i>
WEDGE		Durra Panel is secured to the Durra beams by means of special galvanised steel wedges spaced at nominal 450mm centres inserted in alternate directions through the factory punched slots along the length of the Durra Beam purlin or wall girts & Tee Unit bridging.
UNIVERSAL SUPPORT BRACKET		For suspending light-weight services from the ceiling, Ortech offer universal support brackets which connect to the bottom flange of Durra Steel purlins. The Universal Support Brackets (USBs) are supplied in pairs and are rated to a maximum working load capacity of 60kg per pair. <i>Fixing bolts are not included.</i> Note: Universal Support Bracket not suitable for use with Durra Panel metal clad Finish. Contact Ortech Industries for technical advice.
HIGH LOAD FLYBRACE BRACKET		The high load flybrace bracket bolts to the web of Durra Steel Sections. It is used in situations where the bottom tee flange of Durra Steel Sections are unsuitable as a flybrace connection point.

Tee Unit Bridging - Panel Joiners

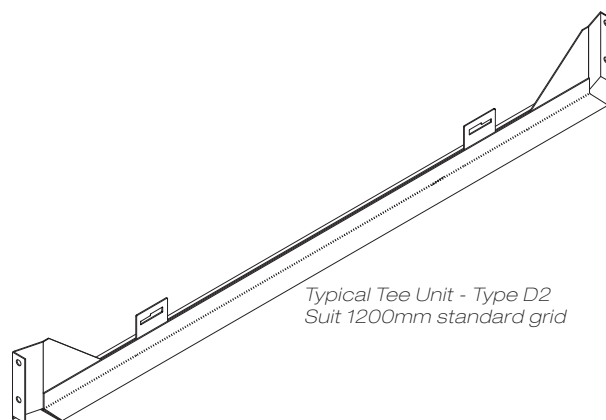
Durra Tee Units are supplied in specific lengths to suit the standard Durra Steel Section grid spacing of 1200mm centres..

Durra Tee Units are used to form the Durra Panel to panel end joint and also act as a bridging member between Durra Duplex and I-Beams.

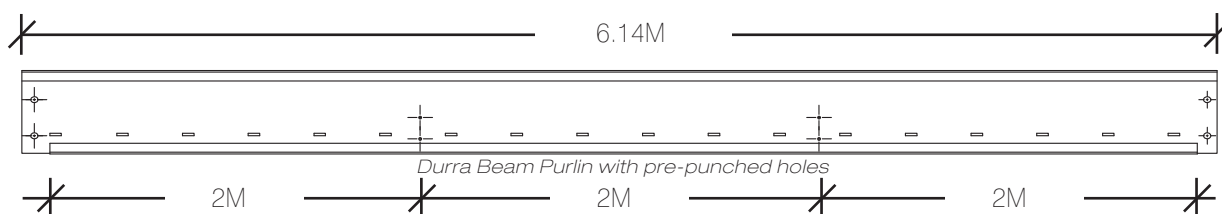
Durra Panel must not be walked on until Tee Units have been bolted into position.

Durra Tee Units are not to be used for the support of building services. Where it is essential to apply point loads to Tee Units, contact Ortech Industries for optional high load tee units.

Durra Tee Units will fit between and connect to the web of the Durra Steel Section using a bolted connection (Type D) via the pre-punched holes in the Durra Steel Section web. Durra Tee Units will typically be spaced at nominal half, third, or quarter points along the span of the Durra Steel Section to enable the installation of equal sizes of Durra Panel per bay. See example below:



Typical Tee Unit - Type D2
Suit 1200mm standard grid



Tee Unit Types

TYPE A - TEK SCREW APPLICATION



TYPE D2 - BOLTED APPLICATION



TYPE D3 - BOLTED APPLICATION



Finishes

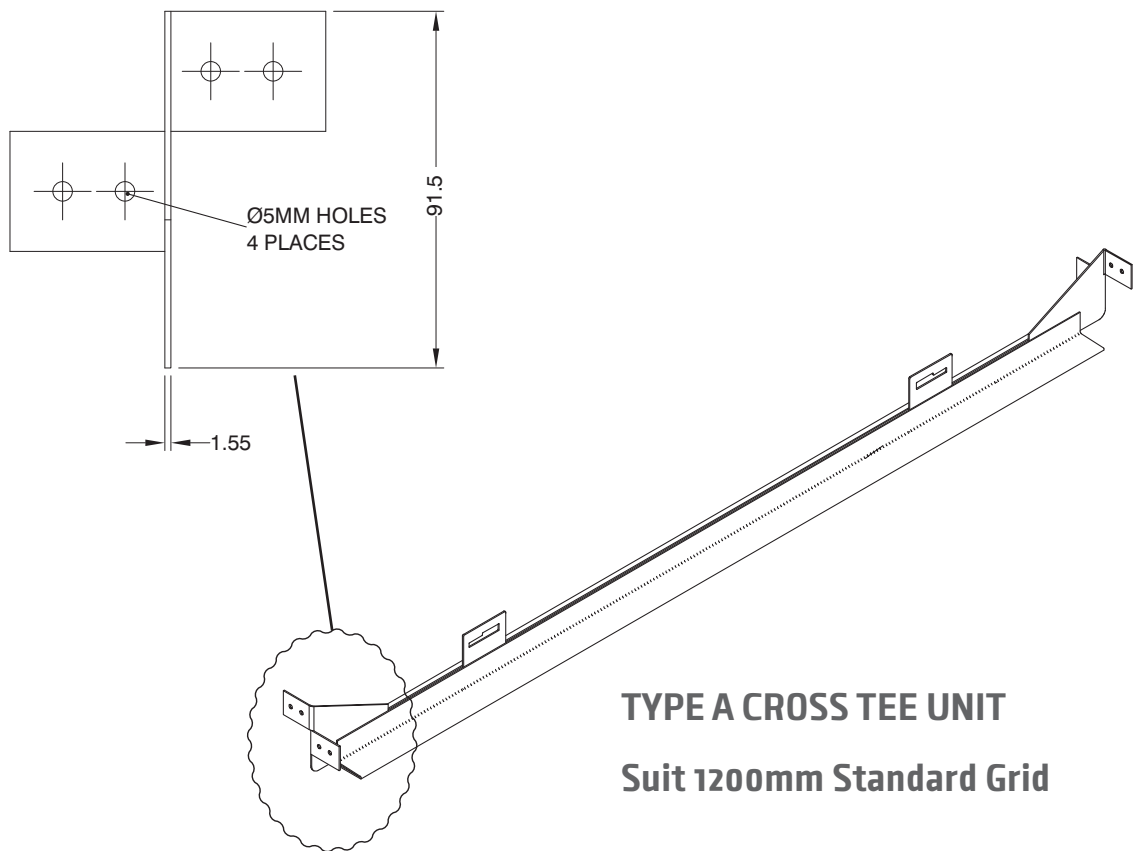
1. Standard Finish: Galvanised Steel
2. Optional Coatings:
 - Powdercoat Finish
 - Epoxy Finish

TYPE D4 - BOLTED APPLICATION



Tee Unit - Type A

Tek Screw Application



Note:

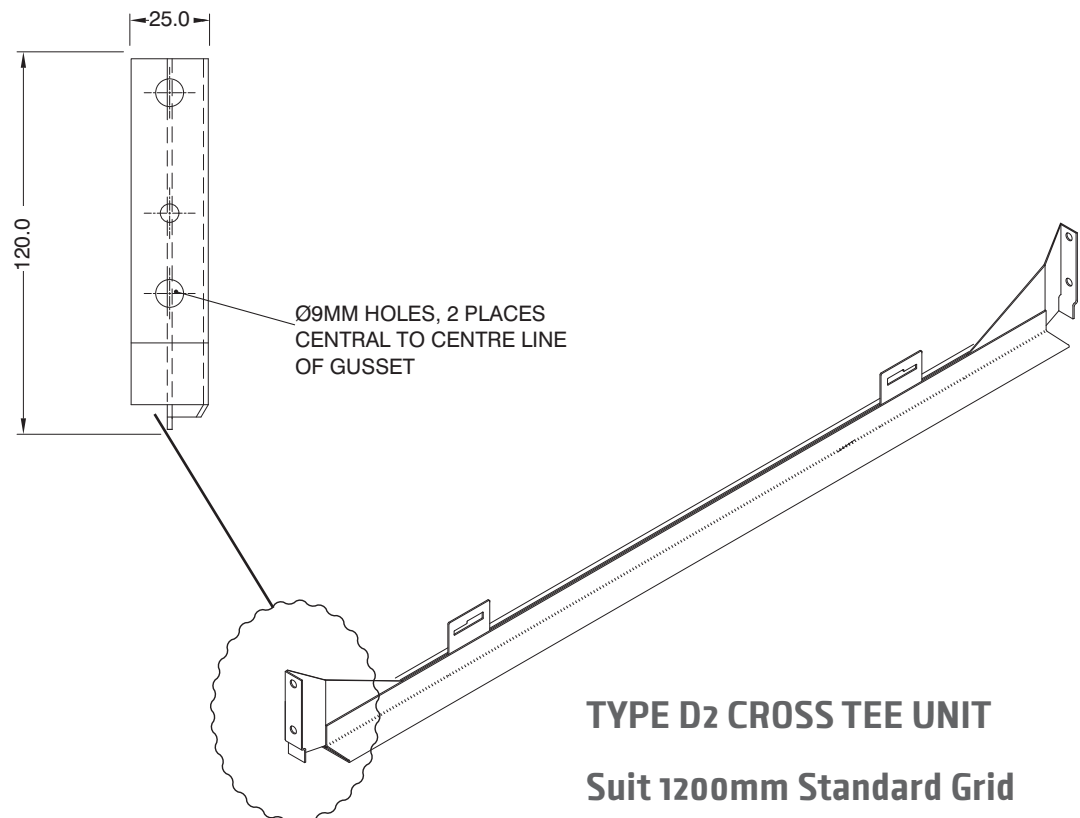
1. Tee Units - Type A are fixed into position with 10 x 16mm Tek screws (supplied by others)

Suitable Beam Applications

TEE UNIT	DUPLEX BEAM	I-BEAM
TYPE A	125 150	N/A

Tee Unit - Type D2

Bolted Application



Note:

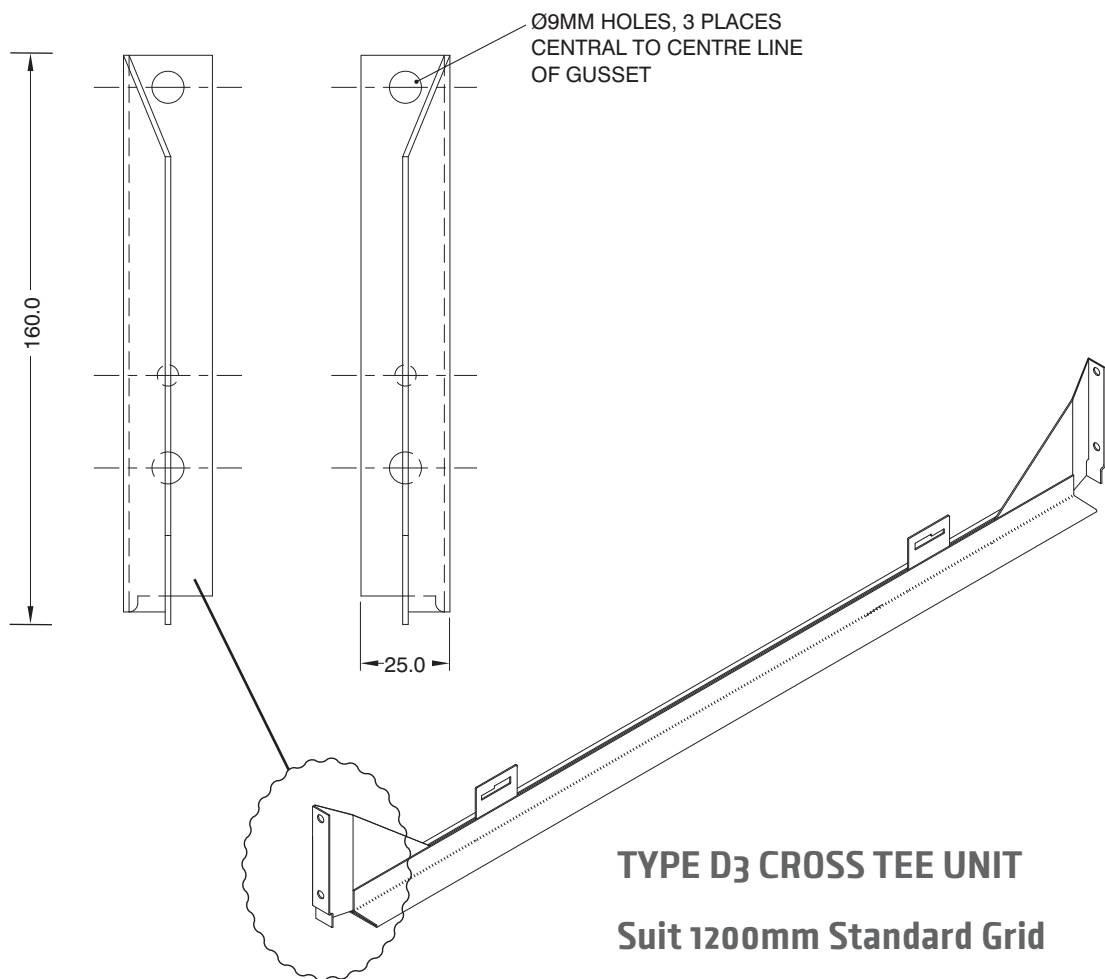
1. Tee Unit Type D2, are supplied complete with 8mm bolts, nyloc nuts and washers.
2. The centre line locations for Tee Units must be marked on Durra Steel Section shop drawings - hole punching dimensions are not required.

Suitable Beam Applications

TEE UNIT	DUPLEX BEAM	I-BEAM
TYPE D2	125 150 175 200 250	175 200 225 250

Tee Unit - Type D3

Bolted Application



Note:

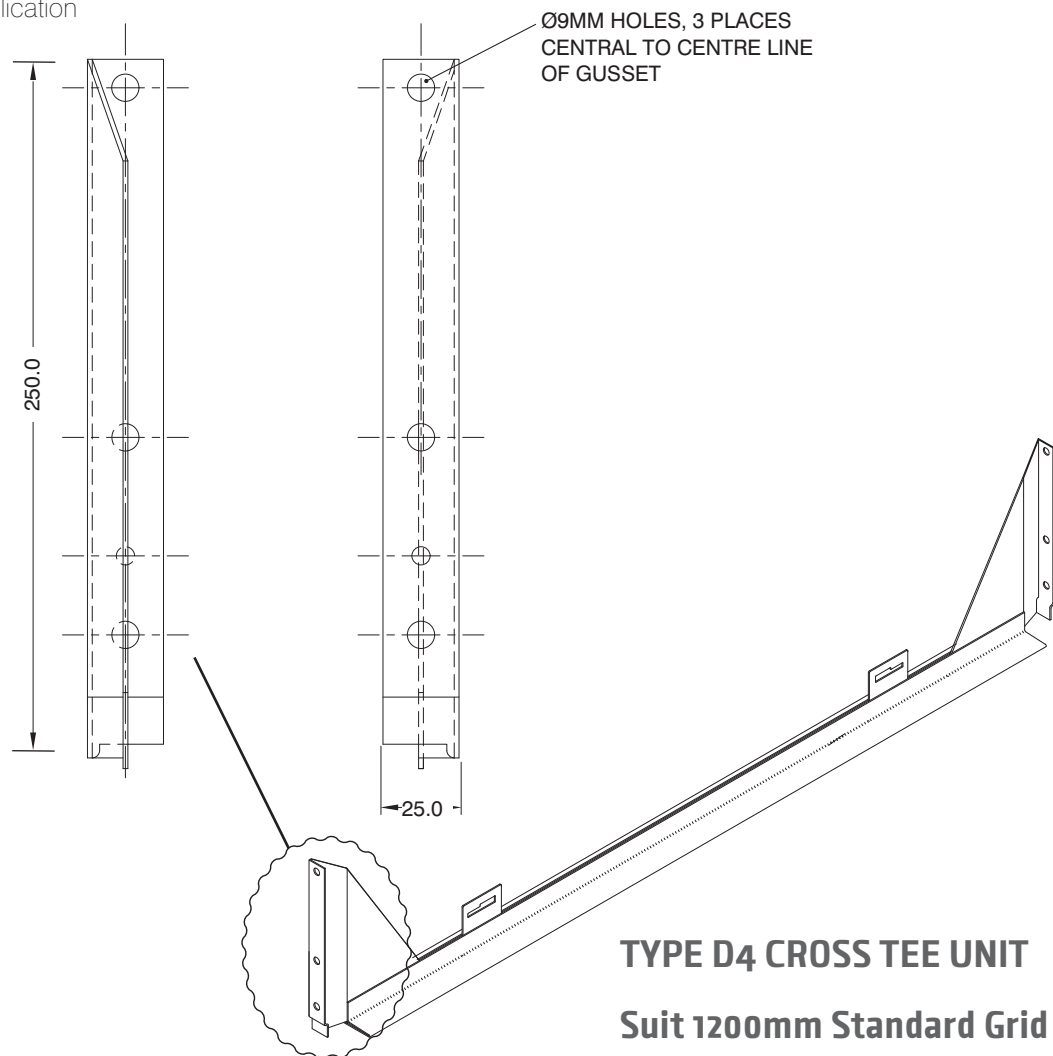
1. Tee Unit Type D3, are supplied complete with 8mm bolts, nyloc nuts and washers.
2. The centre line locations for Tee Units must be marked on Durra Steel Section shop drawings - hole punching dimensions are not required.

Suitable Beam Applications

TEE UNIT	DUPLEX BEAM	I-BEAM
TYPE D3	200 250	300 350

Tee Unit - Type D4

Bolted Application



Note:

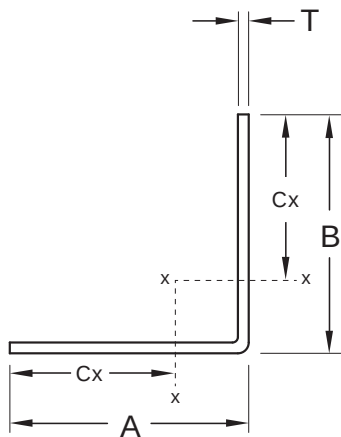
1. Tee Unit Type D4, are supplied complete with 8mm bolts, nyloc nuts and washers.
2. The centre line locations for Tee Units must be marked on Durra Steel Section shop drawings - hole punching dimensions are not required.

Suitable Beam Applications

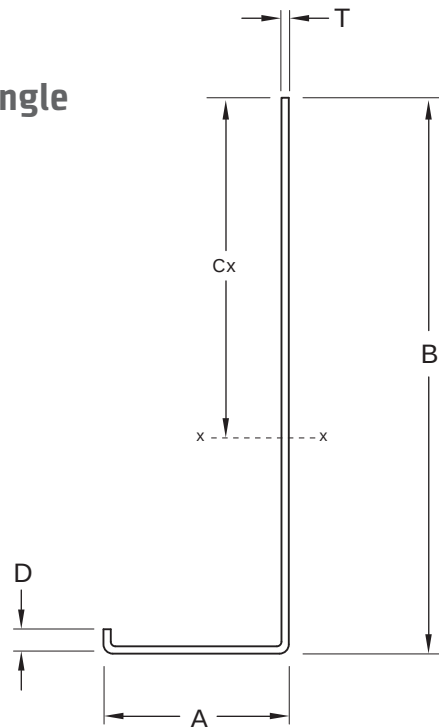
TEE UNIT	DUPLEX BEAM	I-BEAM
TYPE D4	N/A	350 400

Angles

Angle



Wall Angle



Dimensions

SECTION	A	B	D	Cx	T
ANGLE	42	42	-	30.23	1.9
WALL ANGLE	38	114	5	71.25	1.5

Section Properties

SECTION	MOMENT OF INERTIA (10 ³ mm ⁴)	MODULUS OF SECTION (mm ³)	RADIUS OF GYRATION (mm)	CROSS SECTION AREA (mm ²)	WEIGHT
	Ixx	Zxx	rx	A	Kg / per LM
ANGLE	26.72	883	13	157	1.3
WALL ANGLE	329	4621	55.45	234	1.96

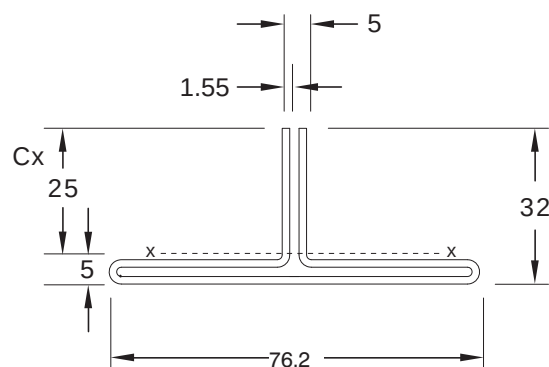
Material Strength

Refer Reference Sheet 3.1.2

YIELD STRENGTH	300 MPa
TENSILE STRENGTH	375 MPa

Base Tee

Base Tee (Standard)



Section Properties

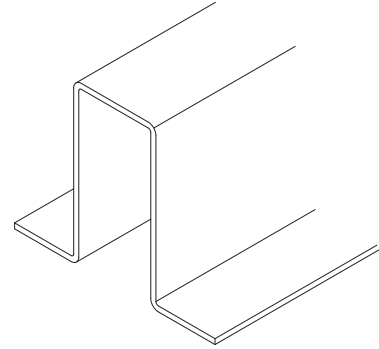
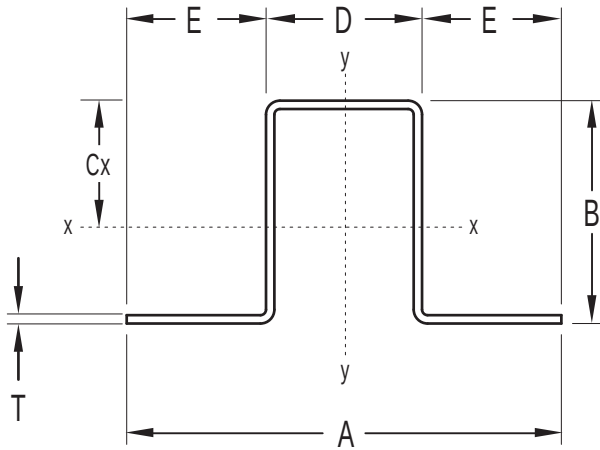
SECTION	MOMENT OF INERTIA (10^6mm^4)	MODULUS OF SECTION (mm^3)	RADIUS OF GYRATION (mm)	CROSS SECTION AREA (mm^2)	WEIGHT
	I_{xx}	Z_{xx}	r_{xx}	A	Kg / per LM
BASE TEE	2.098	829	8.2	308.4	2.42

Material Strength

Refer Reference Sheet 3.1.2

YIELD STRENGTH	300 MPa
TENSILE STRENGTH	375 MPa

Top Hat Sections



Dimensions

SECTION	A	B	D	E	Cx	T
TOP HAT 20	78	20	28	25	12.01	1.50
TOP HAT 30	78	30	28	25	17.65	1.50
TOP HAT 40	78	40	28	25	23.01	1.20
TOP HAT 60	78	60	28	25	33.67	1.20

Section Properties

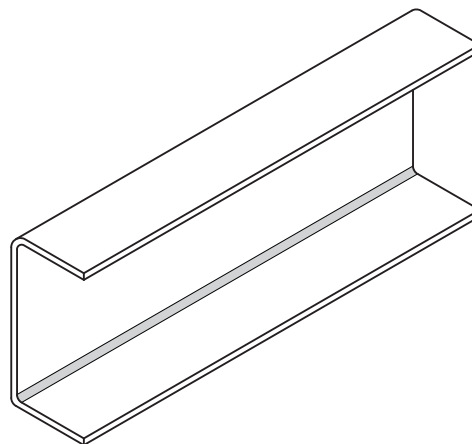
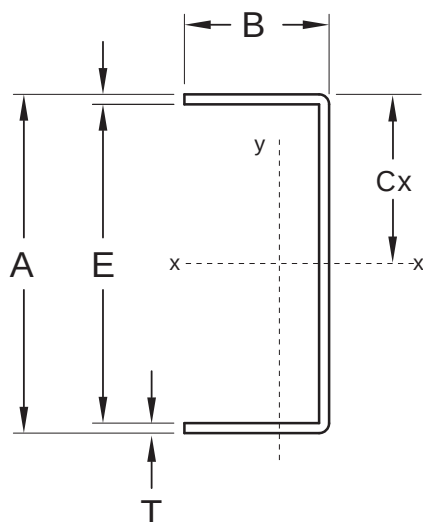
SECTION	MOMENT OF INERTIA (10^3mm^4)	MODULUS OF SECTION (mm^3)	RADIUS OF GYRATION (mm)	CROSS SECTION AREA (mm^2)	WEIGHT
	Ixx	Zxx	rx	A	Kg / per LM
TOP HAT 20	11.24	935.9	7.95	178	1.47
TOP HAT 30	29.04	1645	11.78	209	1.72
TOP HAT 40	45.22	1962.9	15.56	187	1.56
TOP HAT 60	118.5	3520	22.47	235	1.95

Material Strength

Refer Reference Sheet 3.1.2

YIELD STRENGTH	300 MPa
TENSILE STRENGTH	375 MPa

Single Channel



Dimensions

SECTION	A	B	E	Cx	T
50 SINGLE CHANNEL	56.4	27.5	52.5	28.2	1.9
55 SINGLE CHANNEL	61.4	25	57.5	30.7	1.9
60 SINGLE CHANNEL	66.4	23	62.5	33.2	1.9

Section Properties

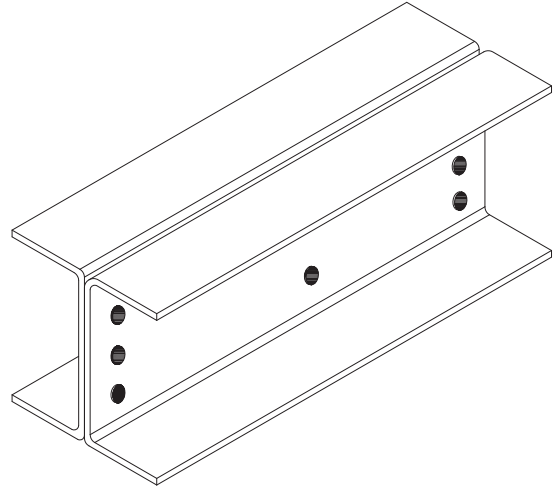
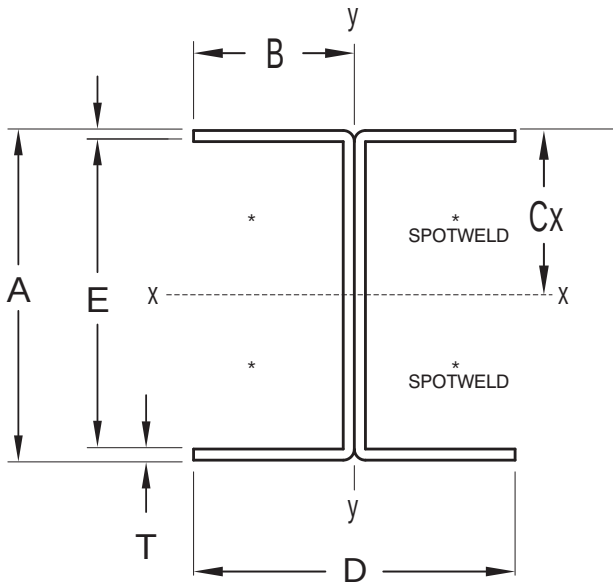
SECTION	MOMENT OF INERTIA (103mm ⁴)	MODULUS OF SECTION (mm ³)	RADIUS OF GYRATION (mm)	CROSS SECTION AREA (mm ²)	WEIGHT
	Ixx	Zxx	rx	A	Kg / per LM
50 SINGLE CHANNEL	103.0	3654	22.2	210	1.65
55 SINGLE CHANNEL	117.1	3813	23.6	210	1.65
60 SINGLE CHANNEL	128.1	3918	24.7	210	1.65

Material Strength

Refer Reference Sheet 3.1.2

YIELD STRENGTH	300 MPa
TENSILE STRENGTH	375 MPa

Double Channel



Dimensions

SECTION	A	B	D	E	Cx	T
50 DOUBLE CHANNEL	56.4	27.5	55	52.5	28.2	1.9
55 DOUBLE CHANNEL	61.4	25	50	57.5	30.7	1.9
60 DOUBLE CHANNEL	66.4	23	46	62.5	33.2	1.9

Section Properties - 50 Double Channel

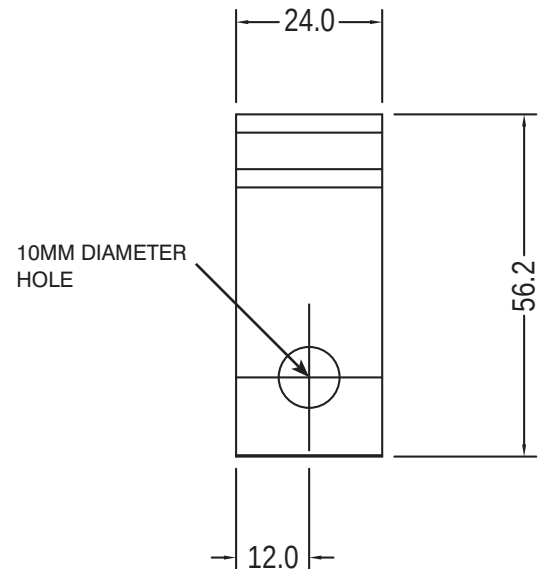
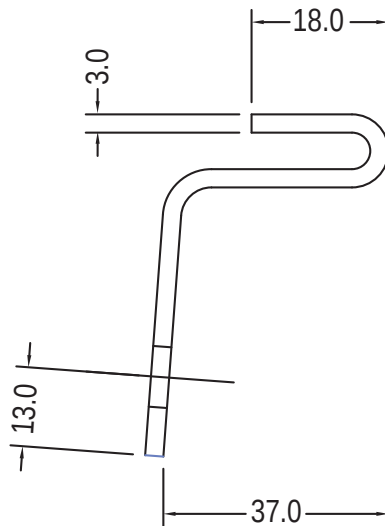
MOMENT OF INERTIA (10 ³ mm ⁴)		MODULUS OF SECTION (mm ³)		RADIUS OF GYRATION (mm)		CROSS SECTION AREA (mm ²)	WEIGHT
Ixx	Iyy	Zxx	Zyy	rx	ry	A	Kg / per LM
241.8	60.8	8210	1967	23.7	11.9	431	3.20

Material Strength

Refer Reference Sheet 3.1.2

YIELD STRENGTH	300 MPa
TENSILE STRENGTH	375 MPa

Universal Support Bracket



For suspending light-weight services from the bottom flange of Durra Steel Sections. Universal Support Brackets are supplied in pairs and are rated to a maximum loading capacity of 60kg per pair.

Note: Fixing bolts are not included.

Finishes

Universal Support Brackets are supplied with a zinc coated finish. Universal Support Brackets can also be supplied with a powdercoat finish.

Universal Support Bracket not suitable for use with Durra Panel metal clad Finish. Contact Ortech Industries for technical advice.

Please contact Ortech Industries for special finishes.

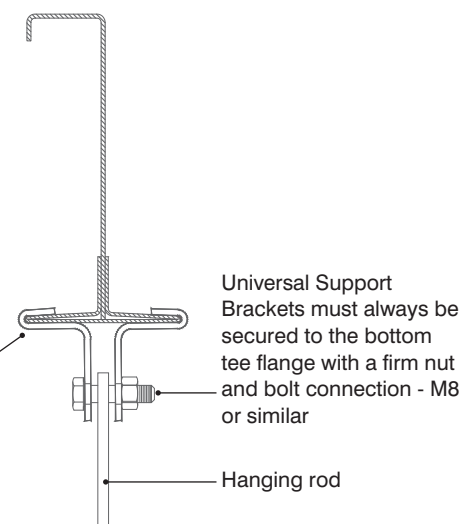
Loading Capacity

Maximum weight	60 Kg per Pair
----------------	----------------

Point Loading

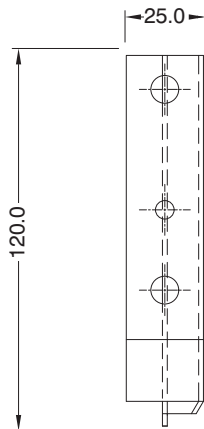
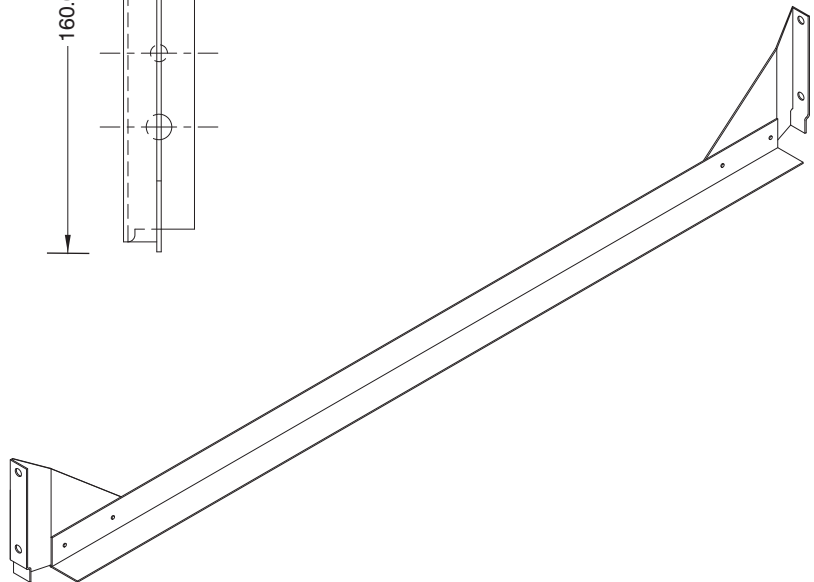
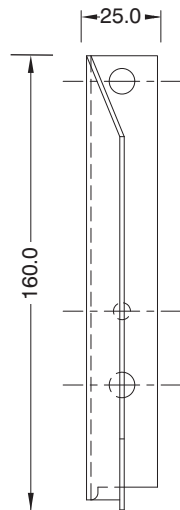
Refer to 3.1.7 for point loading capacity.

Universal Support Brackets must always be a snug fit to the radius of the bottom tee flange



Angle Unit - Type D

Bolted Application

Type D2 End**Type D3 End**

Note:

1. Angle Unit Type D, are supplied complete with 8mm bolts, nyloc nuts and washers.
2. The centre line locations for Angle Units must be marked on Durra Steel Section shop drawings - hole punching dimensions are not required.

Suitable Beam Applications

TEE UNIT	DUPLEX BEAM	I-BEAM
TYPE D2	125 150 175	175 200 225 250
TYPE D3	200 250	300 350 400

Fixing Instructions

All Durra Steel Sections must be securely anchored to fixing grounds using the following methods:

Fixing To Timber

Durra Steel Sections can be connected over or between timber fixing grounds by using a combination of coach screws, bolts and angle end brackets. (Contact Ortech industries for fixing details).

Fixing To Steel - Typical Details

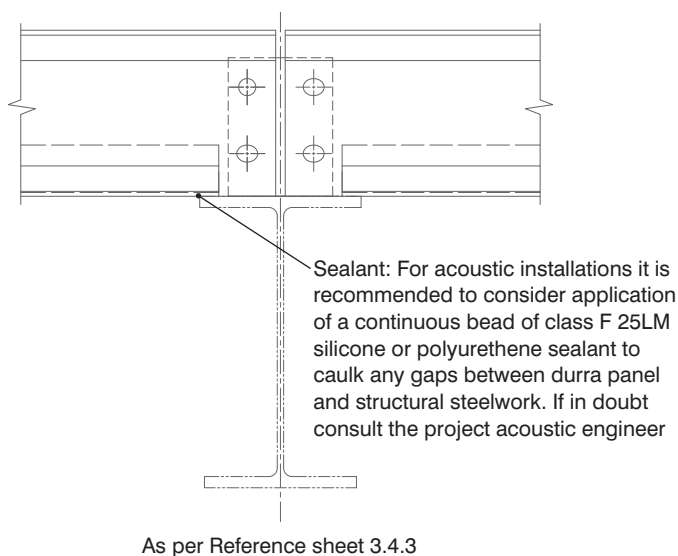
Durra Steel Sections are generally fixed in simple span to structural steelwork with a bolted cleat connection. See below and reference 3.4.3 for typical cleat detail including dimensions.

Support All Edges

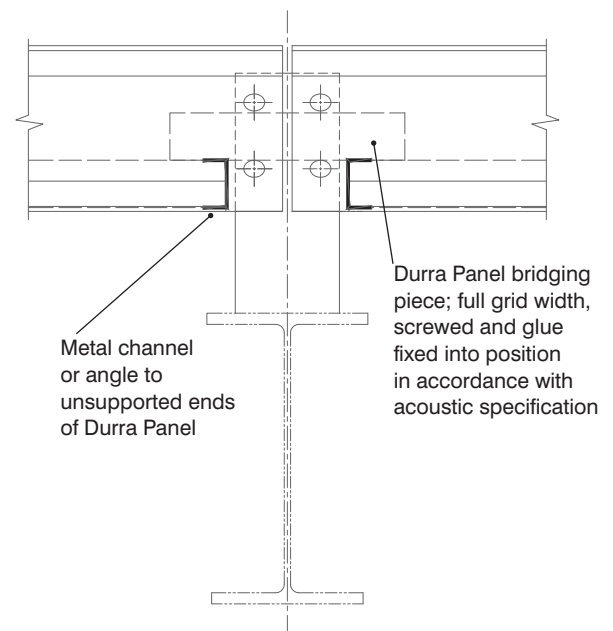
Durra Panel must be provided with 25mm wide support to all edges. In areas where Durra Panel is not provided with direct support from Durra Steel Sections a hardboard packer or similar resilient item must be inserted between the Durra Panel and the underside supporting structural member.

Verges and eaves should be framed to withstand loads imposed by ladders etc. It is recommended that cement sheet clad or Colorbond steel clad Durra Panel is used in all external applications.

Typical Cleat Connection

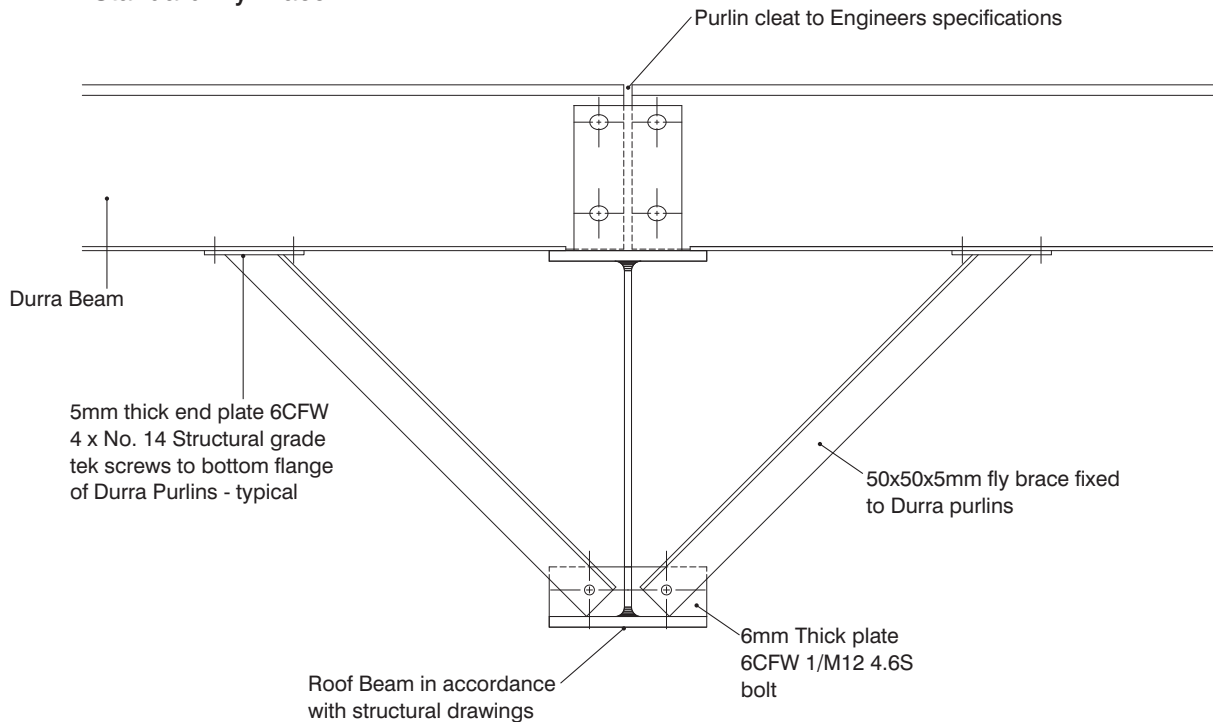


Typical Raised Cleat Connection

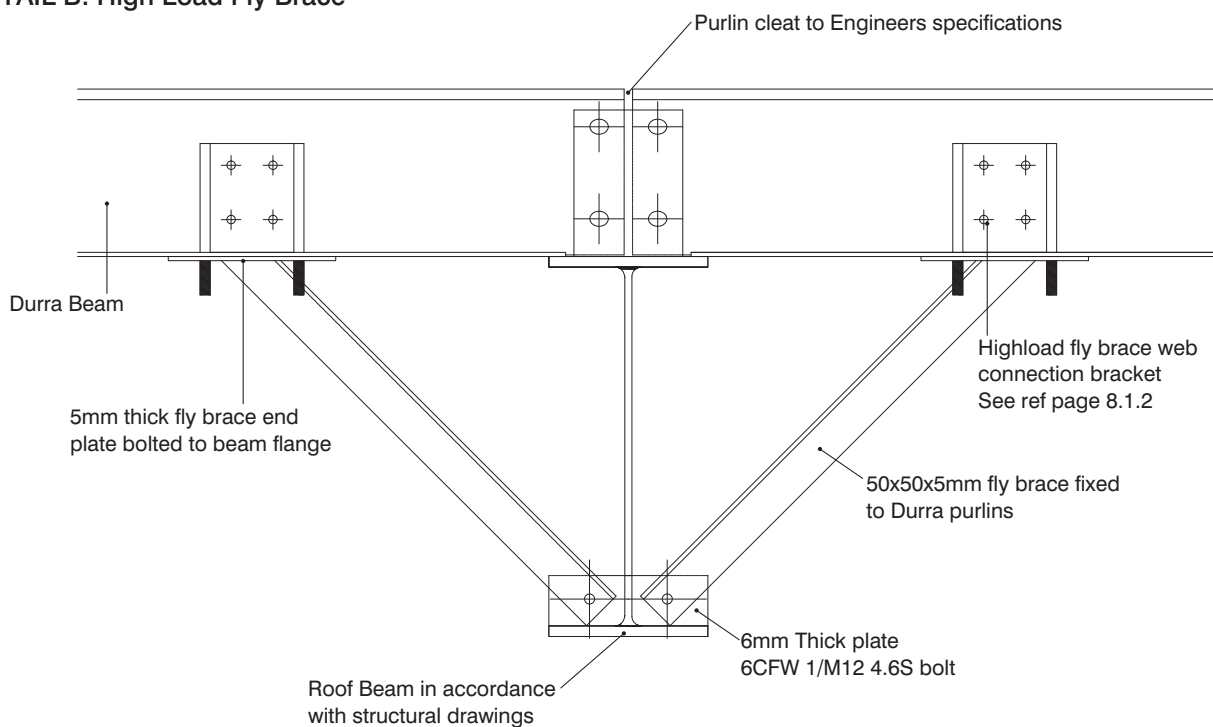


Typical Fly Brace Details - Examples

DETAIL A: Standard Fly Brace



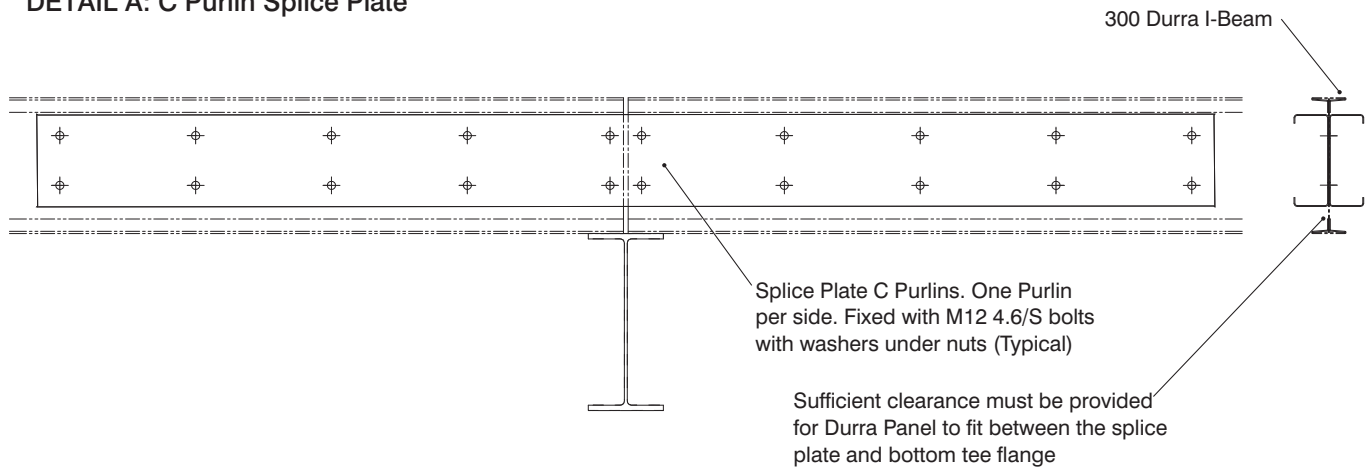
DETAIL B: High Load Fly Brace



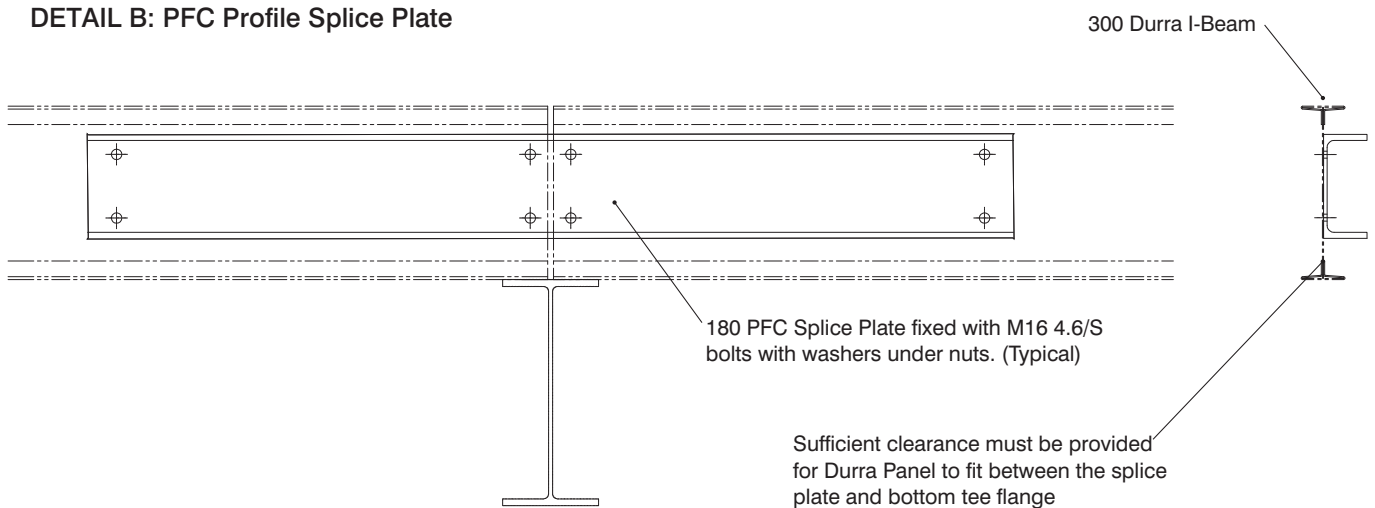
* The typical fly brace details above are examples only for consideration by design engineers.

Typical Splice Plate Details - Examples

DETAIL A: C Purlin Splice Plate



DETAIL B: PFC Profile Splice Plate



* The typical splice plate details above are examples only for consideration by design engineers.

Section 4

Ceiling Systems

Introduction	4.1.1
Roof Ceiling Systems	
Suspended Ceilings	
Exposed Timber Beam Ceilings	
Visual Reference Chart - Single Layer Roof / Ceiling	4.1.2
Systems.....	
Visual Reference Chart - Double Layer Roof / Ceiling	4.1.3
Systems.....	
Visual Reference Chart - Ceilings	4.1.4
Trafficable Suspended Ceilings - Introduction	4.2.1
Typical Details	
Installation Process	
General Installation Notes.....	4.2.10
Setting Out Of Installation Of Ceiling Grid.....	4.2.11
Installation Of Ceiling Grid	4.2.13
General Handling And Storage Information	4.2.17
Products Supplied By Others	4.2.20

NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Introduction

The combination of safe, rapid and economical installation (due to the large size; self supporting and walkable load bearing capacity of Durra Panel) together with a large range of aesthetic surface finishes, plus the added benefits of impact resistance, thermal + acoustic insulation makes Durra Panel a highly versatile ceiling material with wide ranging applications as listed below.

Roof Ceiling Systems

Ortech Industries have developed a wide range of Galvanised Durra Steel Sections and accessories which enables Durra Panel to be installed safely, rapidly and economically in; commercial, industrial and residential applications. The combination of Durra Panel and Durra Steel Sections forms the basis of a highly versatile Roof / Ceiling System that can be walked on during the construction process. The exposed bottom tee flanges of Durra Steel Sections form a linear, symmetrical ceiling pattern as well as providing the necessary 25mm wide perimeter support to the Durra Panels. Pre-punched slots for special lock down fixing wedges are incorporated into the steel sections to lock and restrain Durra Panels down into the grid.

Durra Steel Section profiles include the highly practical Duplex Beams and the high spanning I-Beams (spanning up to 13M in simple span) with Cross Tee Units being required to form the Durra Panel to Panel joint.

Durra Panel and Durra Steel Sections can be assembled on site at ground level into large panelised modules (approximately 100m² in area) and then crane hoisted and connected to structural steelwork using the Durra Lifting Frame. Alternatively, Durra Steel Sections and Cross Tee Units can be installed in the traditional manner (as per C or Z purlins) followed by installation of the Durra Panel using elevated work platforms.

Suspended Ceilings - Standard And Trafficable

Durra Panel used in conjunction with Durra Steel Sections is ideally suited for use in suspended ceilings, particularly where access is required to services contained in the above ceiling void. The Durra Steel Sections provide the minimum requirement of 25mm perimeter panel support. Durra Panel is then fully accessible and walkable for maintenance of services with ease and safety without interruption to work areas below.

The wide range of Durra Steel Sections allow a wide variety of spans to be used, either self supporting between walls or alternatively suspended by threaded rods from structural roof members above.

Exposed Timber Beam Ceilings

Durra Panel can also be used in conjunction with exposed timber beams. The timber beams must be wide enough to provide 25mm support to the long edges of the Durra Panel and be spaced at centres to suit the 1187mm panel width. The Durra Panel to panel end joint can be formed with a variety of materials including; Durra Base Tee, aluminium tee sections, back to back angles or timber trimmers. It is important to secure the Durra Panel in position by using 90mm flat head nails or 75mm type 17 hex head screws spaced at 300mm centres around the panel perimeter. See reference sheet 4.1.4.

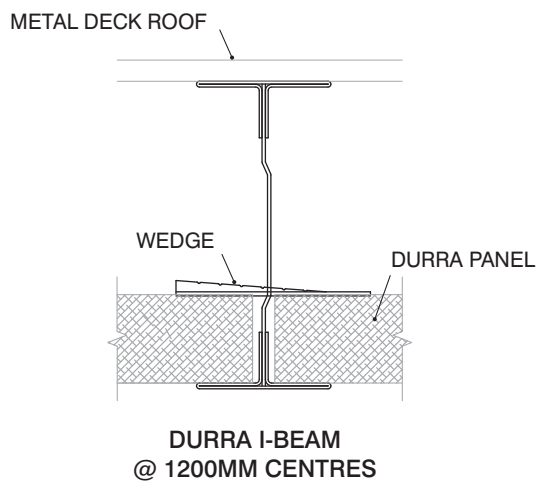
Note 1 : Durra Panel must have 25mm perimeter support in order to support foot traffic during the construction process.

Note 2: Durra Panel must not be walked on until Tee Units have been bolted into position.

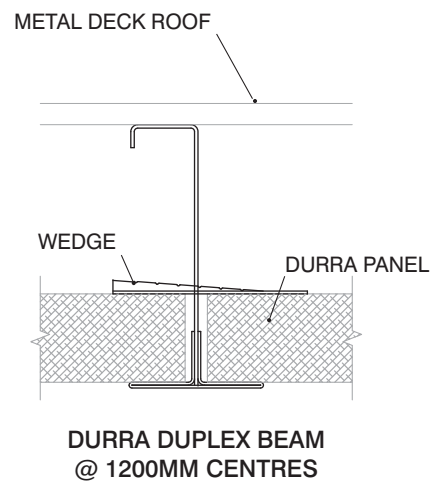
Visual Reference Chart - Single Layer Systems

Durra Roof/Ceiling System

I Beam Purlin



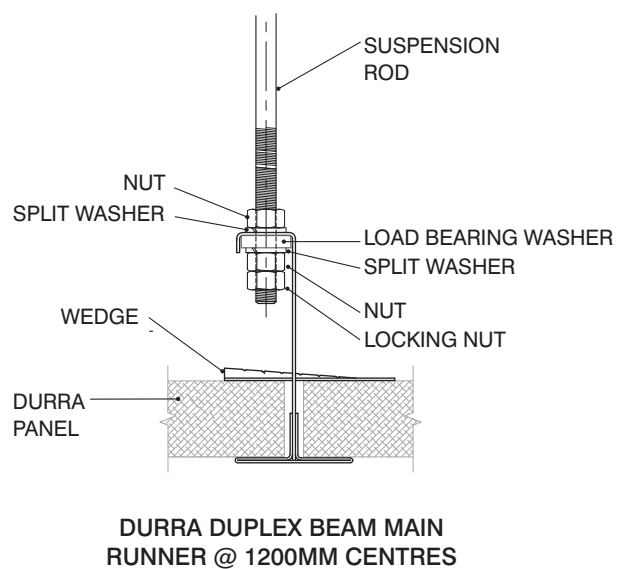
Duplex Beam Purlin



Please Note: Reflective foil and insulation blanket not shown for clarity.

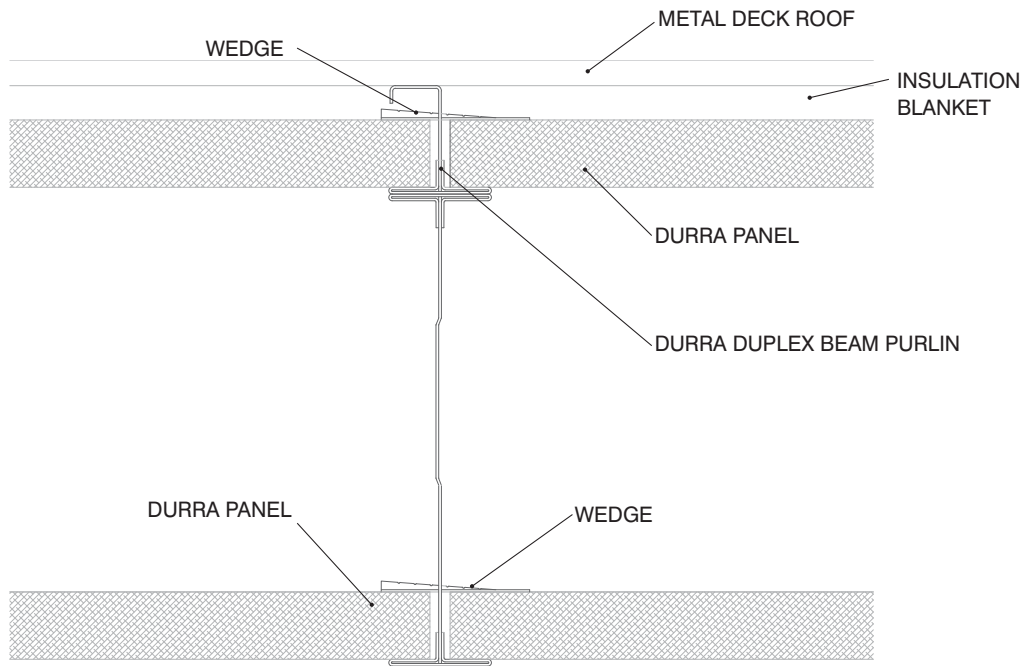
Durra Suspended Ceiling System

Duplex Beam Main Runner



Visual Reference Chart - Double Layer Systems

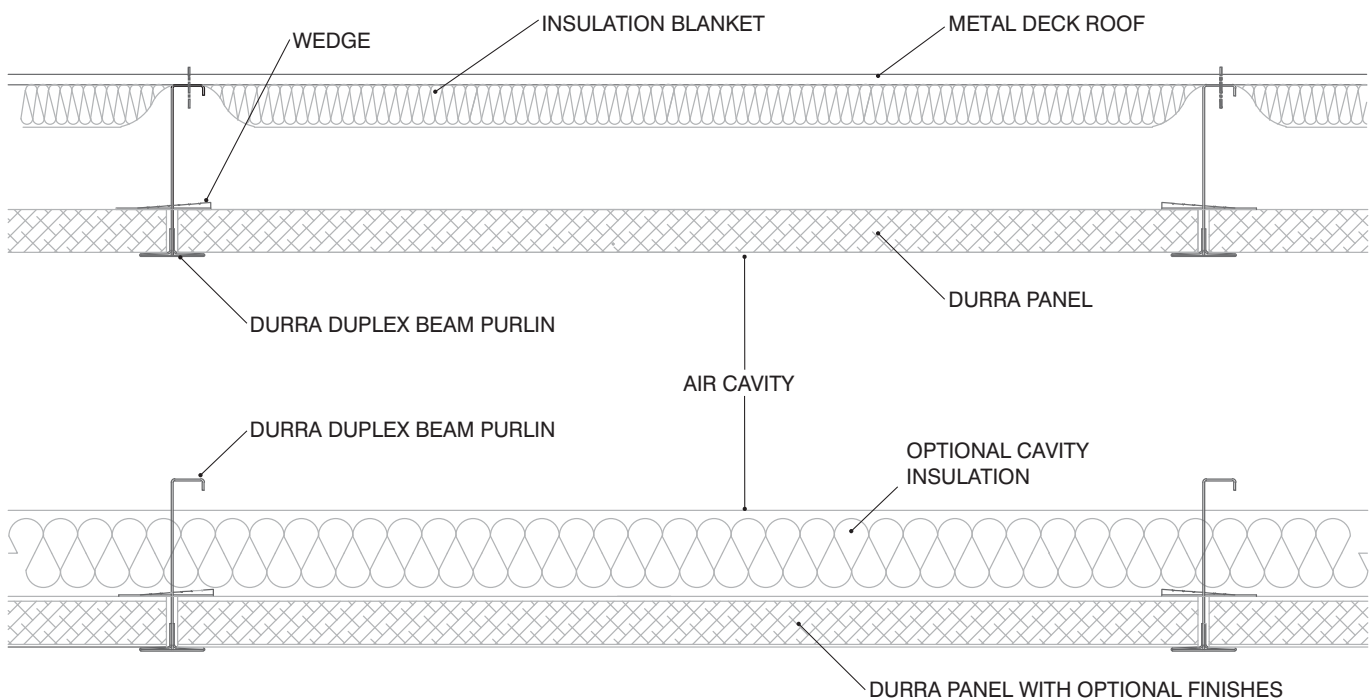
I-Beam And Duplex Beam - Connected



DURRA I-BEAM @ 1200MM CENTRES

NOTE: Durra I Beam and Duplex Beam can be fixed together on site or be supplied as a one piece factory assembly.

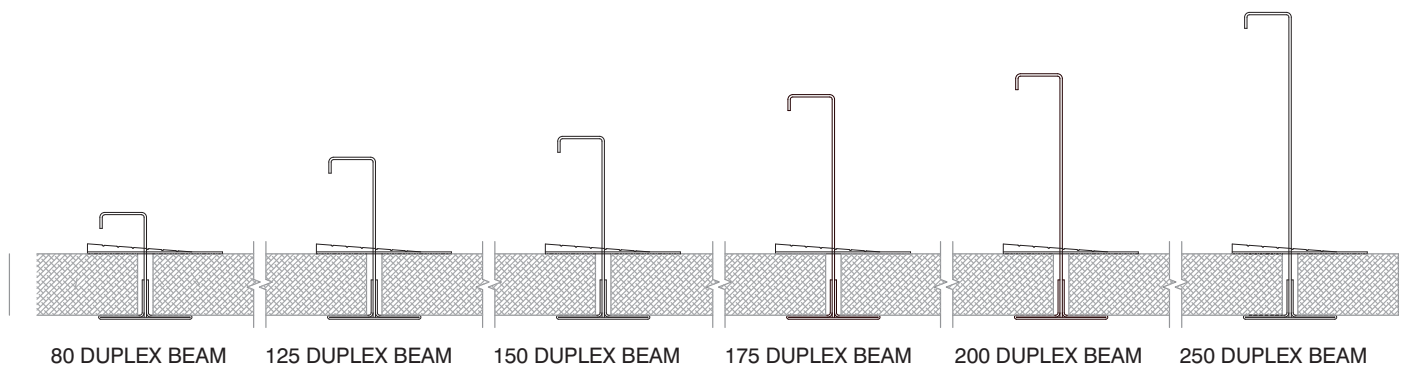
I-Beam Or Duplex Beam - Disconnected



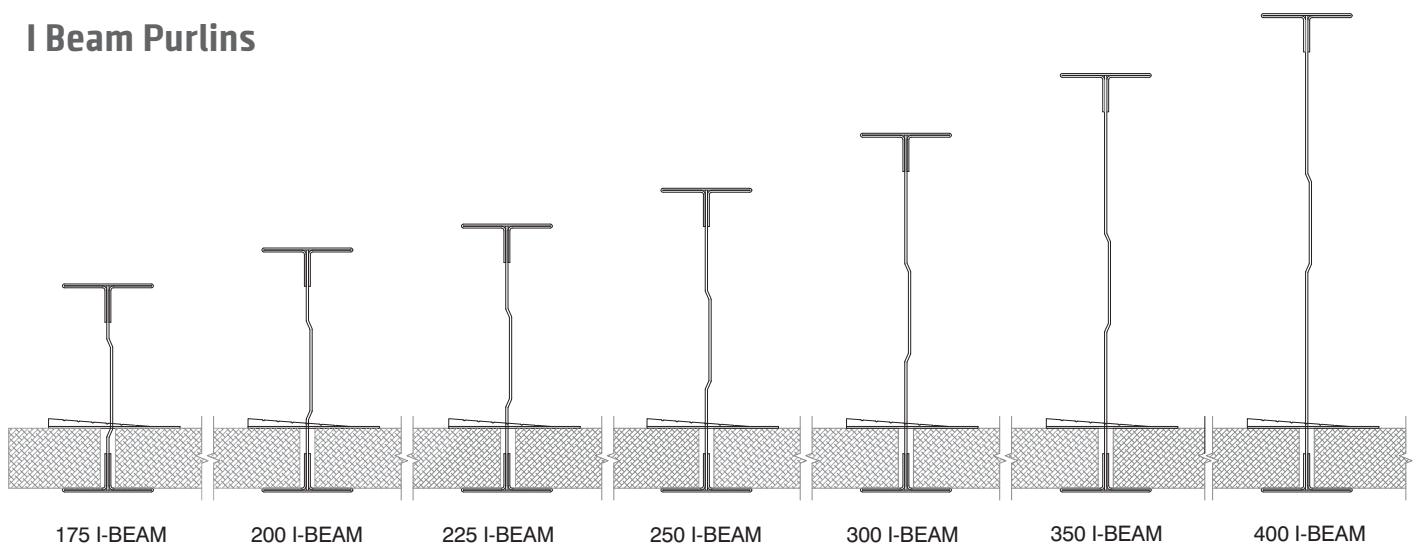
Visual Reference Chart - Ceilings

Durra Panel Roof/Ceiling Systems

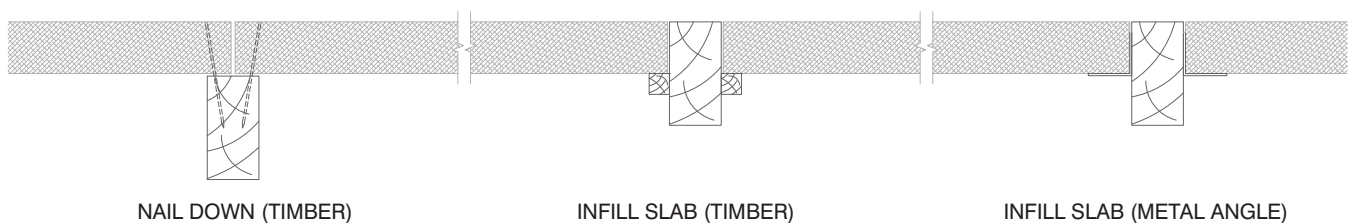
Duplex Beam Purlins



I Beam Purlins



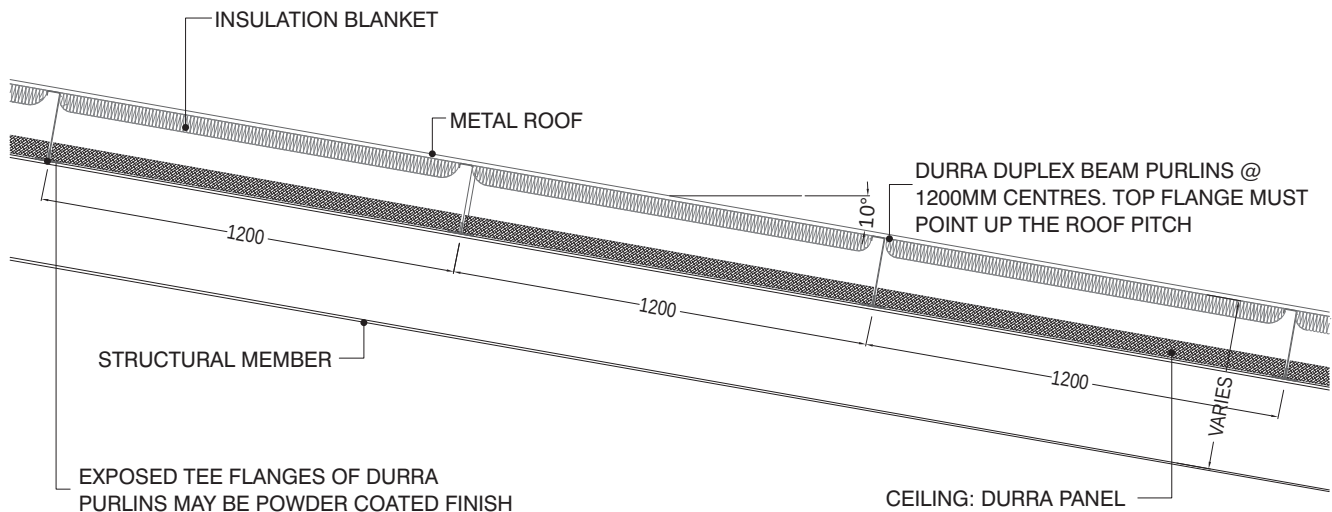
Durra Panel Ceiling: Exposed Timber Beams



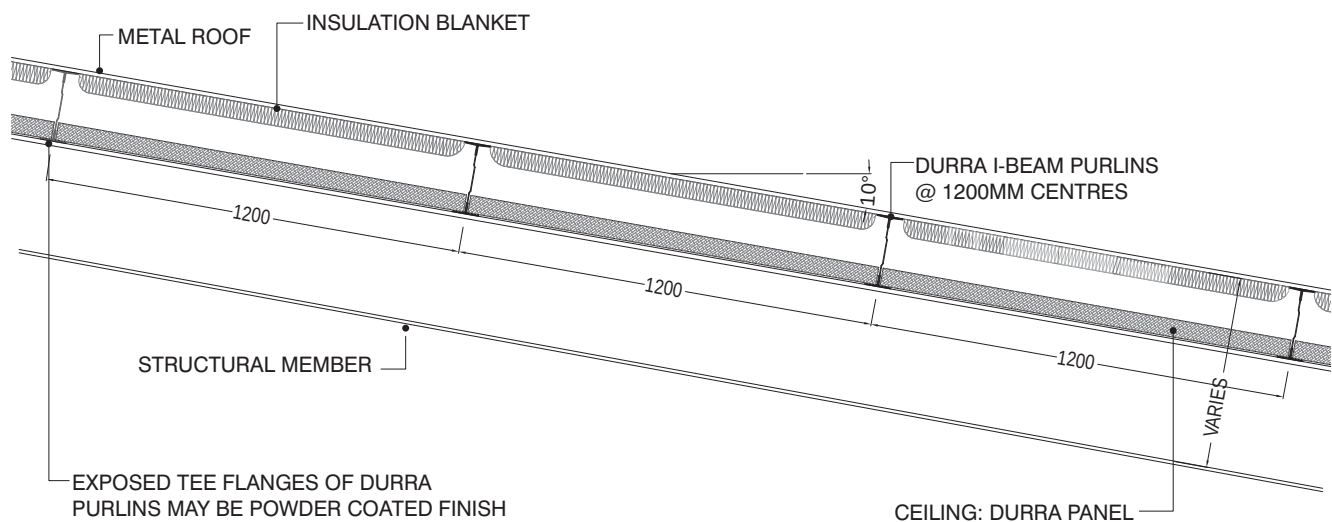
Visual Reference Chart - Ceilings

Durra Panel Roof/Ceiling Systems

Durra Duplex Beam Purlin: Fixed Over Graded Structural Steel Rafters

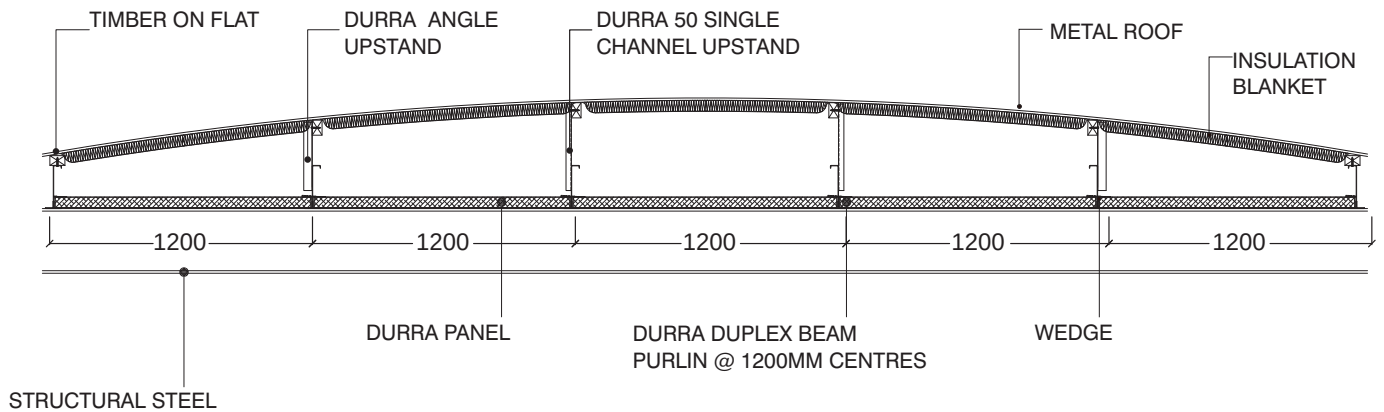


Durra I-Beam Purlin: Fixed Over Graded Structural Steel Rafters

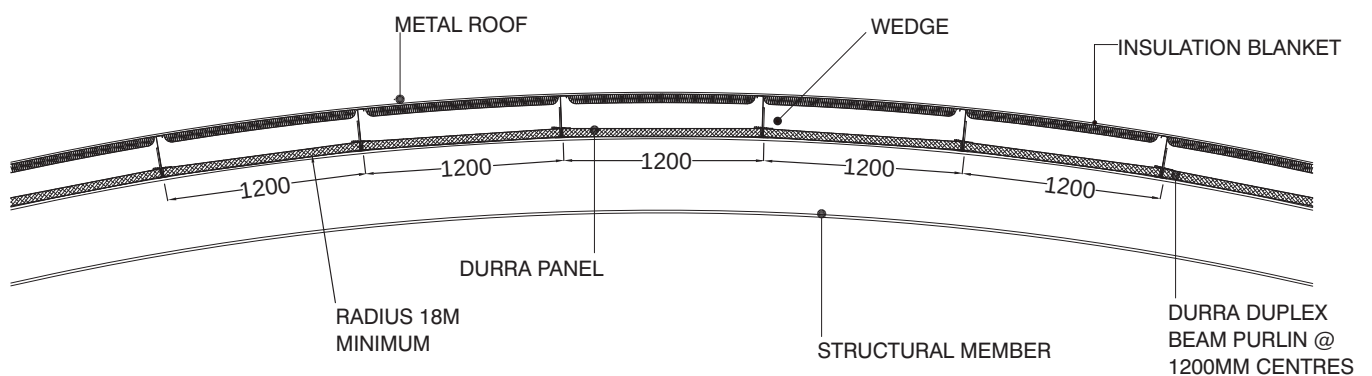


Visual Reference Chart - Ceilings

Curved Roof Over Level Structural Steel



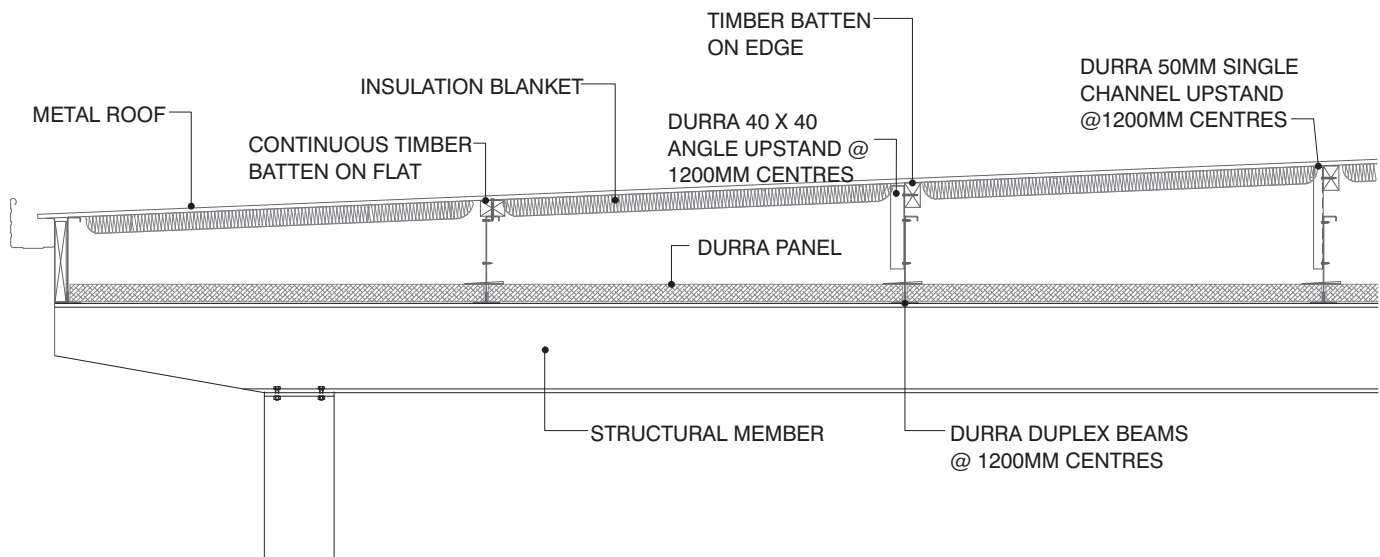
Curved Roof Over Graded Structural Steel



Visual Reference Chart - Ceilings

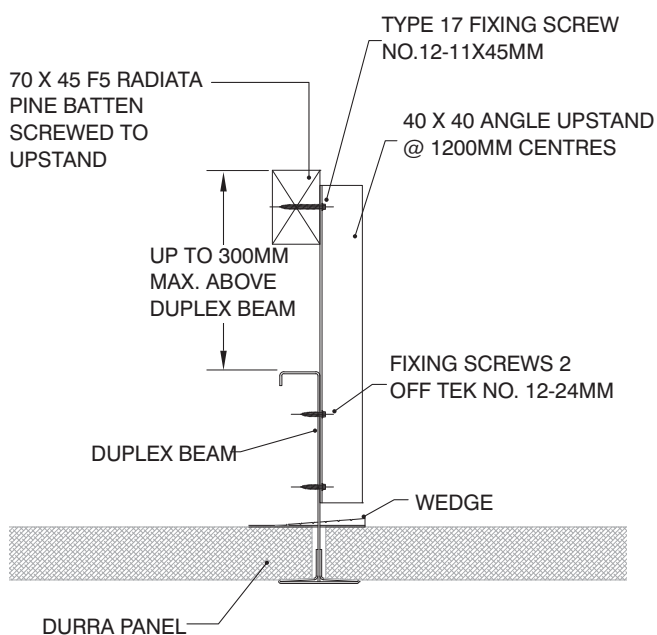
Graded Purlin System

Durra Duplex Beam Or I-Beam - Typical Installation Over Level Structural Steel Rafters With Graded Purlins

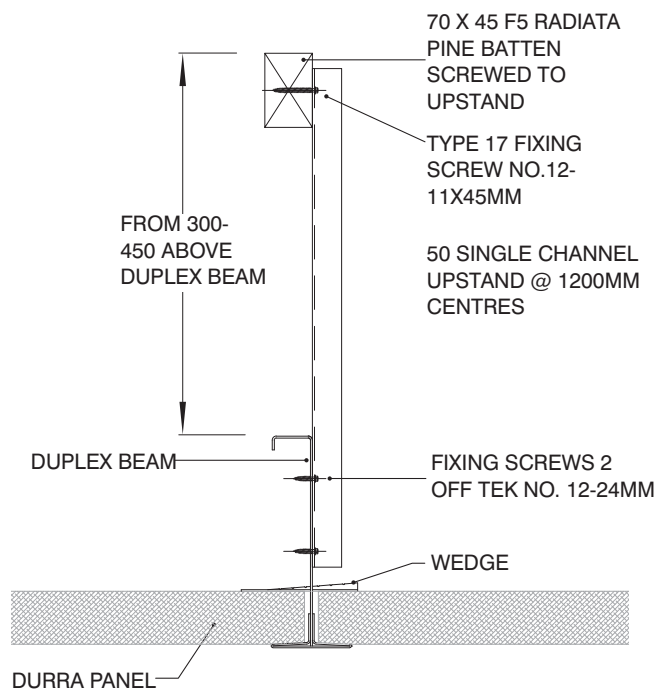


Uprand Detail - Graded Purlins

Durra Angle Upstand



Durra Channel Upstand



Trafficable Suspended Ceilings



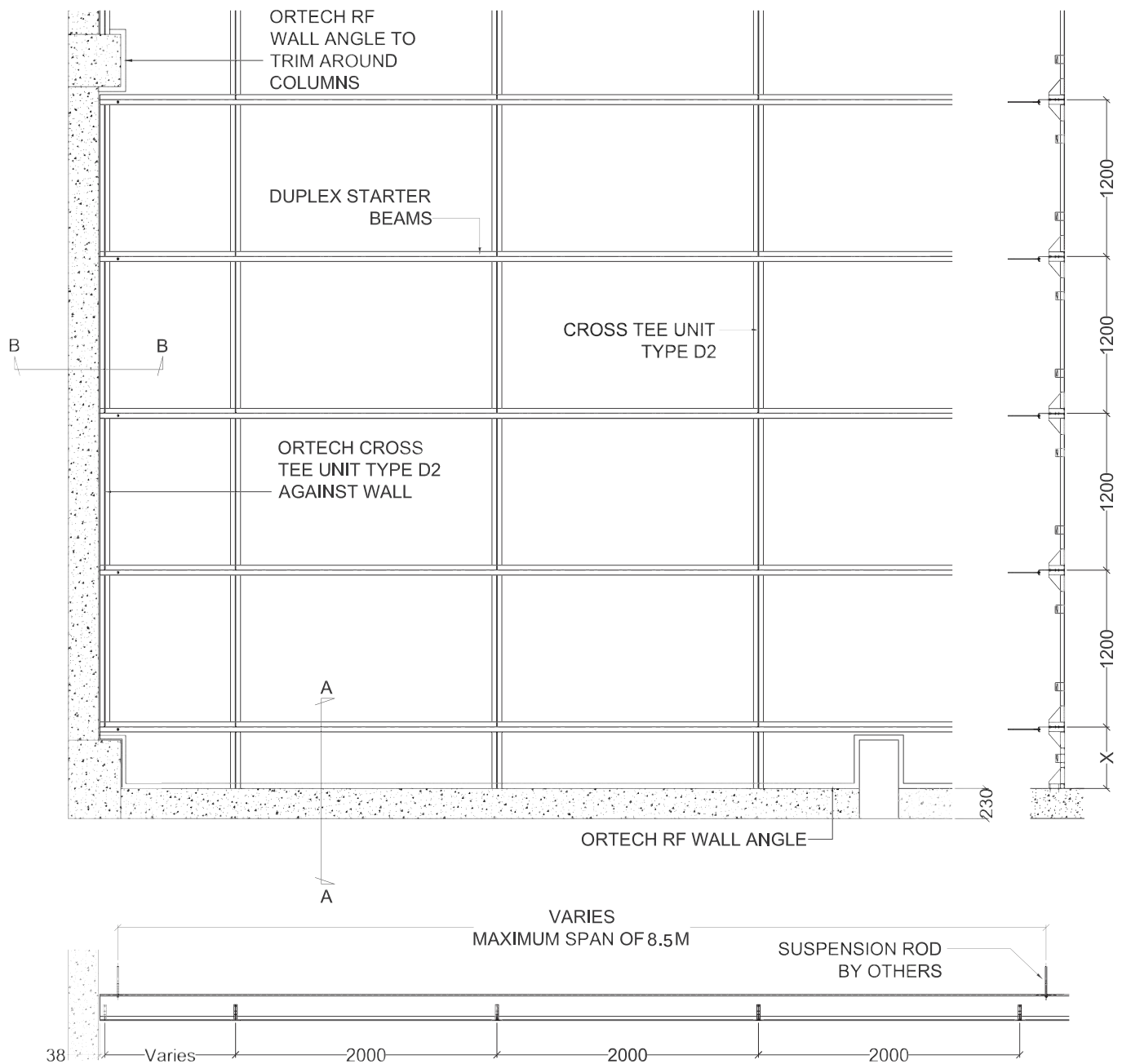
Introduction

The following reference pages are intended to provide Designers, Engineers, Builders and Sub-Contractors with:

1. A general understanding of the Durra Trafficable Suspended Ceiling.
2. A simple reference manual outlining standard construction details for the Durra Trafficable Suspended Ceiling.
3. Typical installation details for the various components that are typically used during the ceiling installation process.

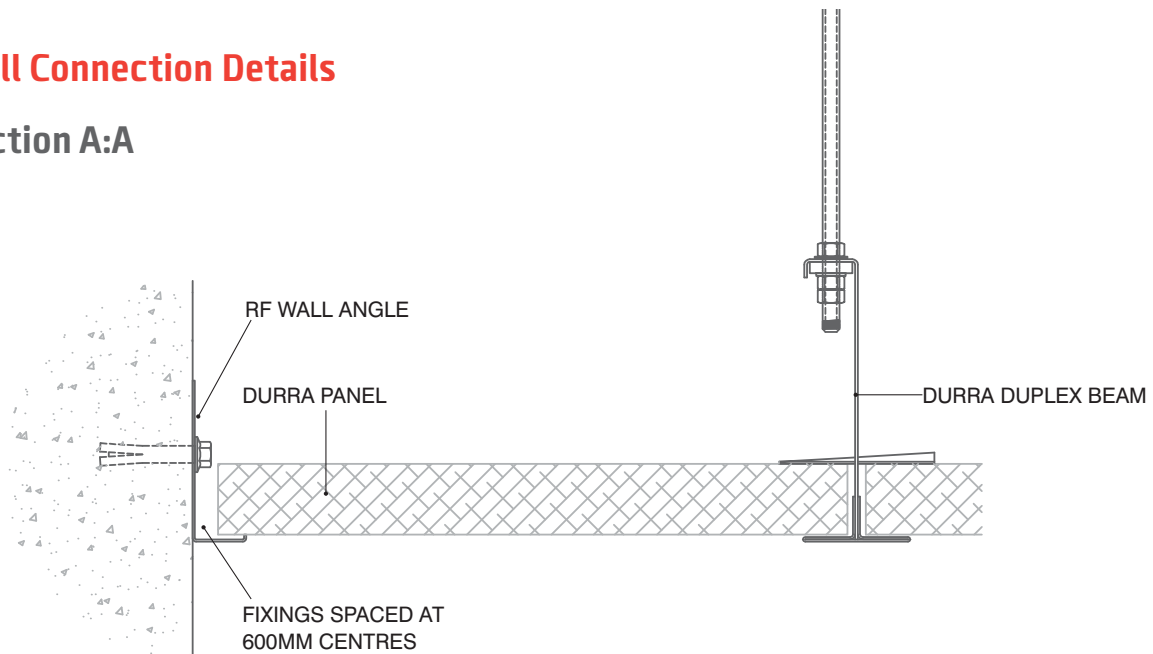
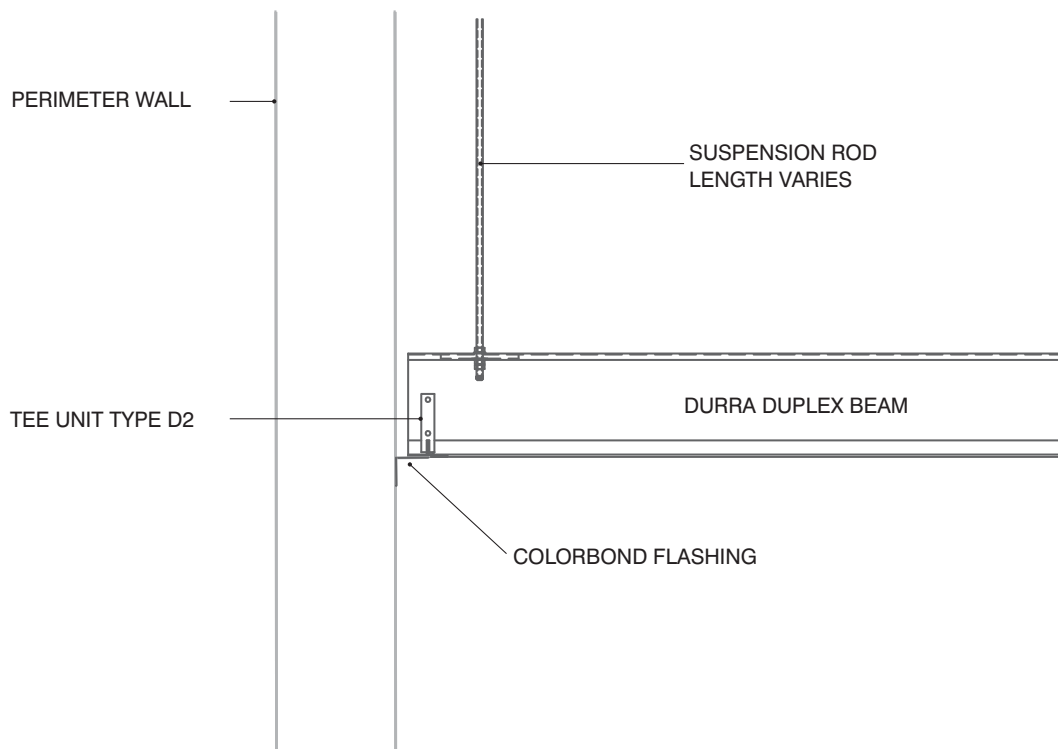
NOTE: The information presented within this Manual is not to be taken as a Design. The information in this manual is for consideration by the project Architects, Engineers and Contractors for conformance with in country regulations and statutory requirements. Installation details may be varied to suit individual project requirements.

Example: Typical Trafficable Suspended Ceiling Using 200 Duplex Beam Main Runner 2000 X 1200Mm Grid



General Note:

Maximum span for Duplex Beam Main Runner is 8.5M (250 Duplex).

Wall Connection Details**Section A:A****Section B:B**

(A) Durra Panel S50 Plain

Cross section of Durra Panel core

Durra Panel is manufactured through a unique dry extrusion process that converts a wasted renewable resource, wheat or rice straw fibre into tough versatile and durable construction board.

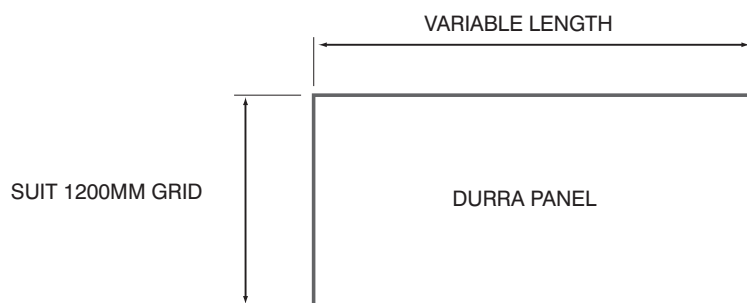
There are no chemical binding agents used in the manufacturing process. The straw fibre is compressed under extreme heat and pressure to form the panel core. A kraft liner is adhered to the panel core with a water based PVA glue. The extruded panel is machine cut to the required length and the cut ends automatically sealed to complete the encapsulation and production process.

Durra Panel can be used on its own or be supplied with a wide variety of surface finishes.

Some examples are as follows:

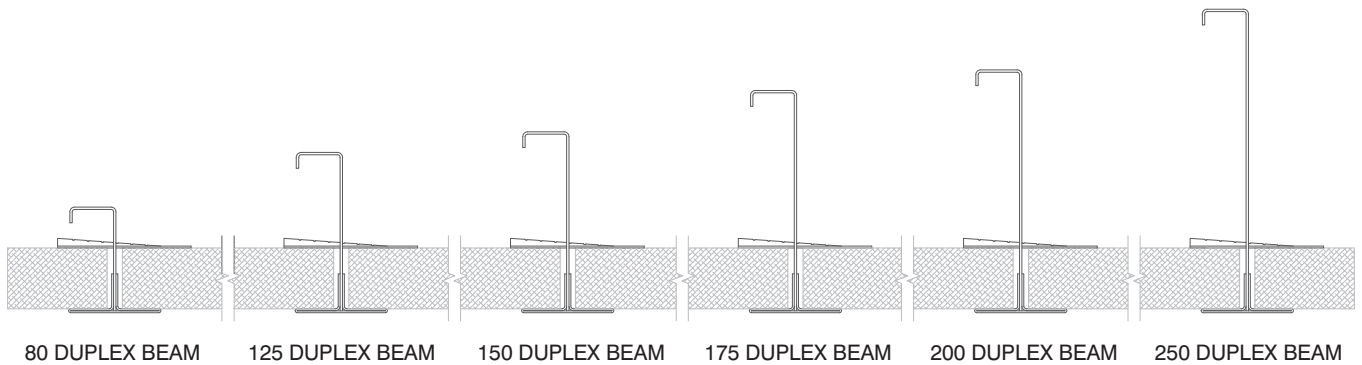
- Cement Sheet Laminate (4.5mm thickness) Single Face
- Colorbond Steel Laminate (0.55mm thickness) Single Face.

Durra Panel can be safely walked upon when supported by just 25mm around the panel perimeter by the Trafficable Ceiling metal grid. Durra Panel is highly impact and fire resistant with the added benefits of acoustic and thermal insulation, Durra Panel is the natural alternative for your project needs.

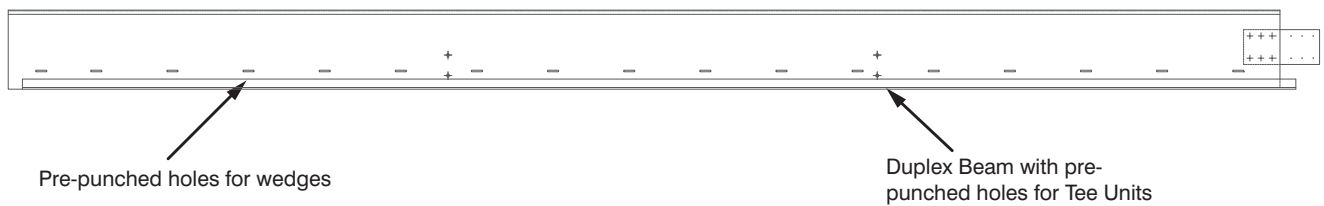


WIDTH	1187mm (Suit 1200mm ceiling grid)
LENGTH	1800 - 3000mm (Length can be varied to suit project requirements)
THICKNESS	Nominal 50mm
WEIGHT	Nominal 18.5 kg/m ²

Note: Durra Panel can be supplied with a wide range of laminates including cement sheet and Colorbond Steel. Please contact Ortech Industries for information regarding weights and thickness of laminated products.

(B) Durra Duplex Beam: Suspended Ceiling Main Runners**Duplex Beam Range**

Duplex Beam Main Runners - typical spacing @ 1200mm centres.

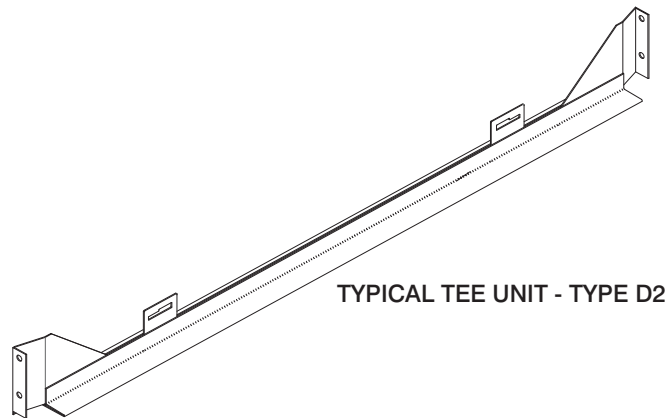
**Duplex 'Intermediate' Beam**

DUPLEX BEAMS	WEIGHT	MAXIMUM SPAN
80 DUPLEX BEAM	Nominal 4.70 kg/LM	2.4m
125 DUPLEX BEAM	Nominal 5.00 kg/LM	4.8m
150 DUPLEX BEAM	Nominal 5.21 kg/LM	5.2m
175 DUPLEX BEAM	Nominal 5.76 kg/LM	6.0m
200 DUPLEX BEAM	Nominal 5.88 kg/LM	7.2m
250 DUPLEX BEAM	Nominal 6.49 kg/LM	8.5m
BASE TEE WIDTH	76mm	
LENGTH	To suit project requirements	
FINISH	Galvanised Steel Z 275 gm/m2	
Note: The bottom tee flange of Duplex Beam Main Runners and Tee Unit Cross Runners are available in both powder coat and epoxy paint finishes.		

(C) Cross Tee Unit Type D: Panel To Panel Joiners

- Cross tee units are located between Duplex Beams (where needed), to form the panel to panel joint. They are also used to secure full width ceiling penetrations.
- Socket head cap screw fixings are supplied for fixing Tee Units between Duplex Beam main runners (2 no. Per Tee Unit end).

Note: Type A Tee Units are also available for Tek Screw fixing between Duplex Beam Main Runners.

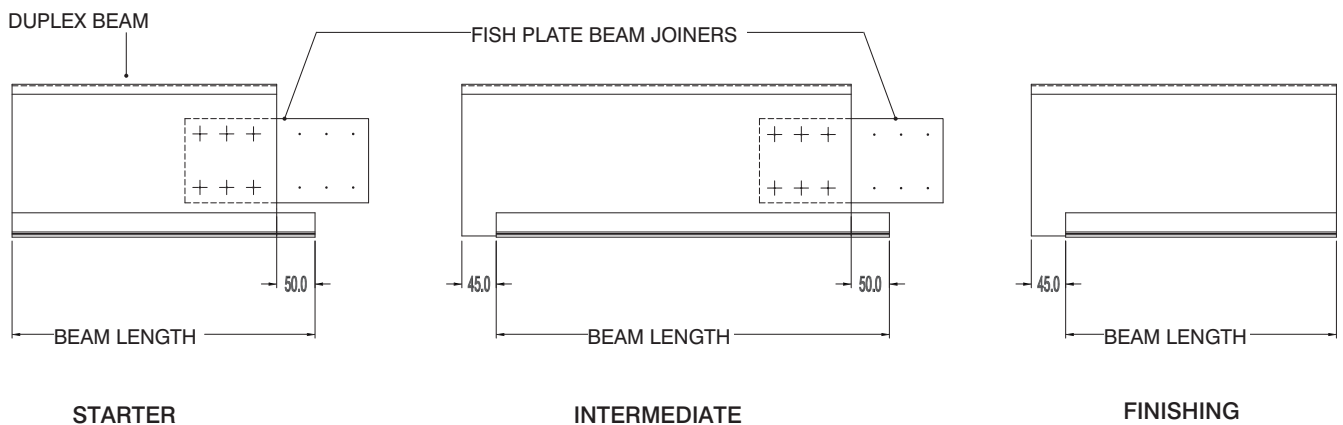
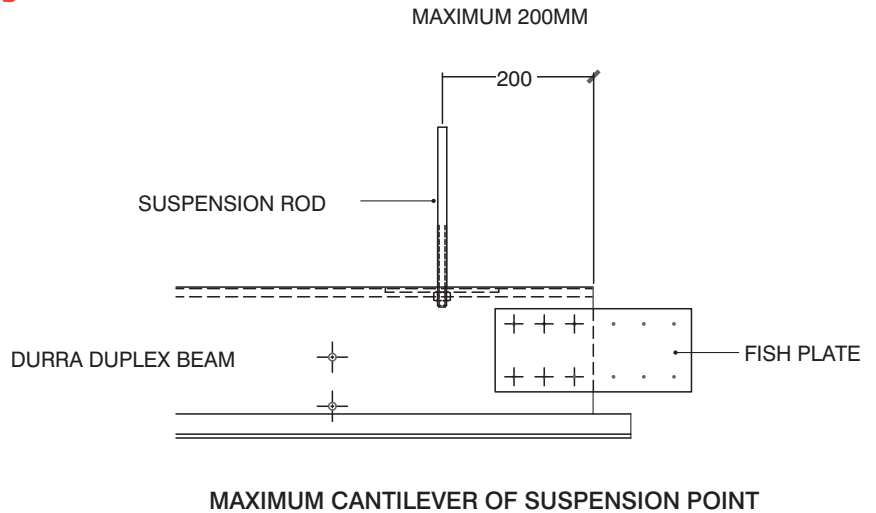


TYPICAL TEE UNIT - TYPE D2

BASE TEE WIDTH	76mm
LENGTH	1200mm (Suit typical 1200mm grid, can be varied to suit project requirements)
WEIGHT	Nominal 3 kg/unit
FINISH	Galvanised Steel Z 275 gm/m ²
Note: The bottom tee flange of Duplex Beam Main Runners and Tee Unit Cross Runners are available in both powder coat and epoxy paint finishes.	

(D) Fish Plate: Beam Joiners

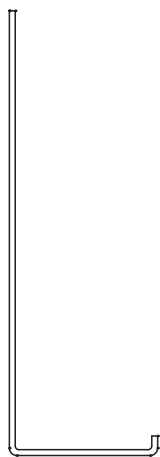
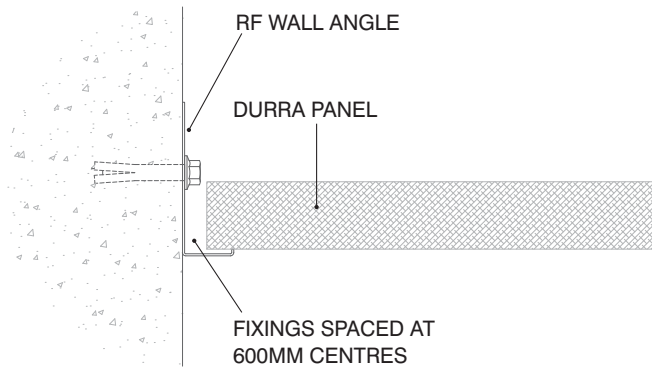
- Used to join Duplex or I Beam main runner sections together.
- Fish Plates are supplied factory fixed to Duplex Starter and Intermediate Beams.
- Pan head screw fixings with nyloc nuts.



WIDTH	2.5mm
LENGTH	240mm
WEIGHT	Nominal 0.2 kg/m
FINISH	Galvanised Steel Z 275 gm/m ²
Note: The bottom tee flange of Duplex Beam Main Runners and Tee Unit Cross Runners are also available in both powder coat and epoxy paint finishes.	

(E) Roll Formed (RF) Wall Angle

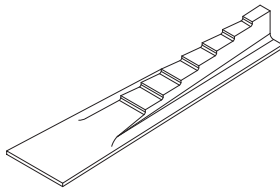
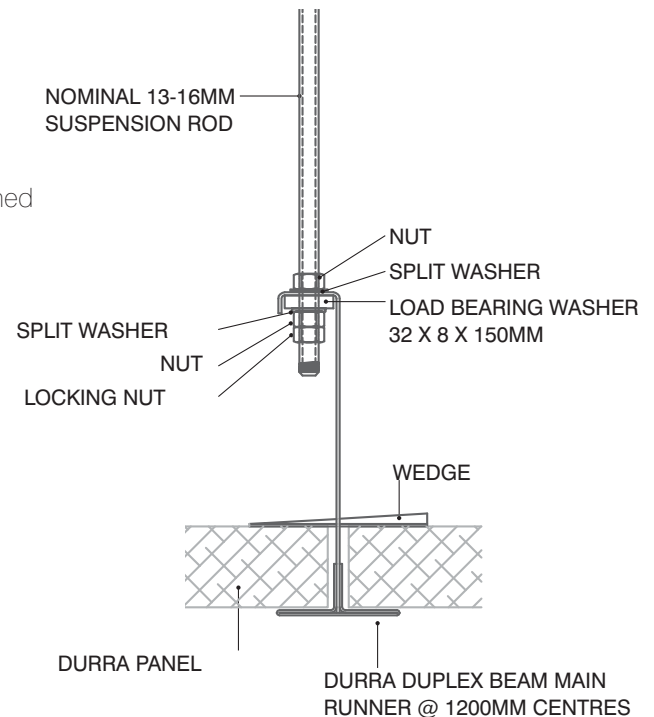
- Used to support Durra Panel at the interface with perimeter walls.
- Also used to support Durra Panel at the interface with columns and other elements of the building.
- Not to be used as a structural element of the building process.
- RF Wall Angle is generally attached to the structure using fixings spaced at 600mm centres.

**RF WALL ANGLE****TYPICAL WALL CONNECTION**

DIMENSIONS	114mm x 38mm
LENGTH	6m
WEIGHT	Nominal 1.96 kg/LM
FINISH	Galvanised Steel Z 275 gm/m2
Note: Available in both powder coat and epoxy paint finishes.	

(F) Durra Panel Wedges

- Used to firmly clamp Durra Panel down into the ceiling grid.
- Inserted in alternating directions through pre-punched slot holes in the web of Duplex Beams.
- Wedges spaced at nominal 450mm centres.

**WEDGE****TYPICAL SUSPENDED CEILING**

WIDTH	25mm
LENGTH	115mm
WEIGHT	Nominal 0.03 kg/unit
SPACING	Nominal 450mm centres

(G) Aluminium Sealing Tape

- Used to seal all cut panel edges and patch/repair panel where the kraft liner face has been damaged or punctured during construction.
- Aluminium sealing tape must be applied immediately to prevent exposure to moisture and/or wet environments.

WIDTH	120mm
LENGTH	50M

General Installation Notes

The following installation details are provided as the recommended method of installation by Ortech Industries to cover typical site situations.

Project/Job Safety Analysis, Work Method Statements and the likes are to be prepared and be the responsibility of those undertaking the installation of the Trafficable Suspended Ceiling.

Setting Out is a critical aspect when installing the Trafficable Suspended Ceiling. Accordingly we recommend the following process be adopted:

Structural Steel Support Grid

1. Check to ensure that the structural steel grid is sound and can be used to connect, suspend and support the load of the Trafficable Suspended Ceiling.
2. Establish the lowest point of the existing structural steel support grid as this will determine the maximum height to which the Trafficable Suspended Ceiling can be set above the floor level.
3. Mark accordingly as this will be the reference point in setting out levels for installation of suspension rods that will support the Trafficable Ceiling. Generally the same set up procedures apply that are used for light weight suspended ceiling systems.

Existing Walls

1. Check that the perimeter and internal walls are square to each other and also level (i.e. Not bowed or containing hollows)
2. Mark accordingly as these points will determine the plan line/s of the new Trafficable Suspended ceiling grid.

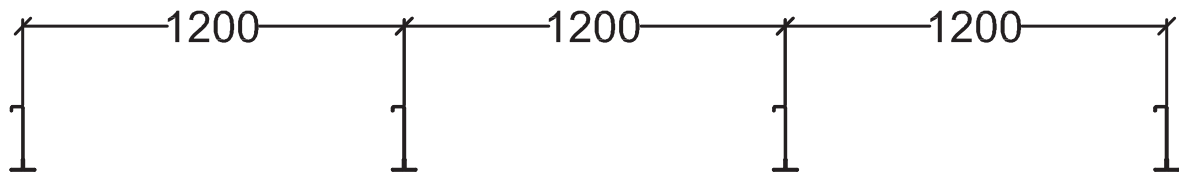
Support All Edges

Durra Panel must be provided with 25mm wide support to all edges. In areas where Durra Panel is not provided with direct support from Durra Steel Sections a hardboard packer or similar resilient item must be inserted between the Durra Panel and the underside supporting structural member.

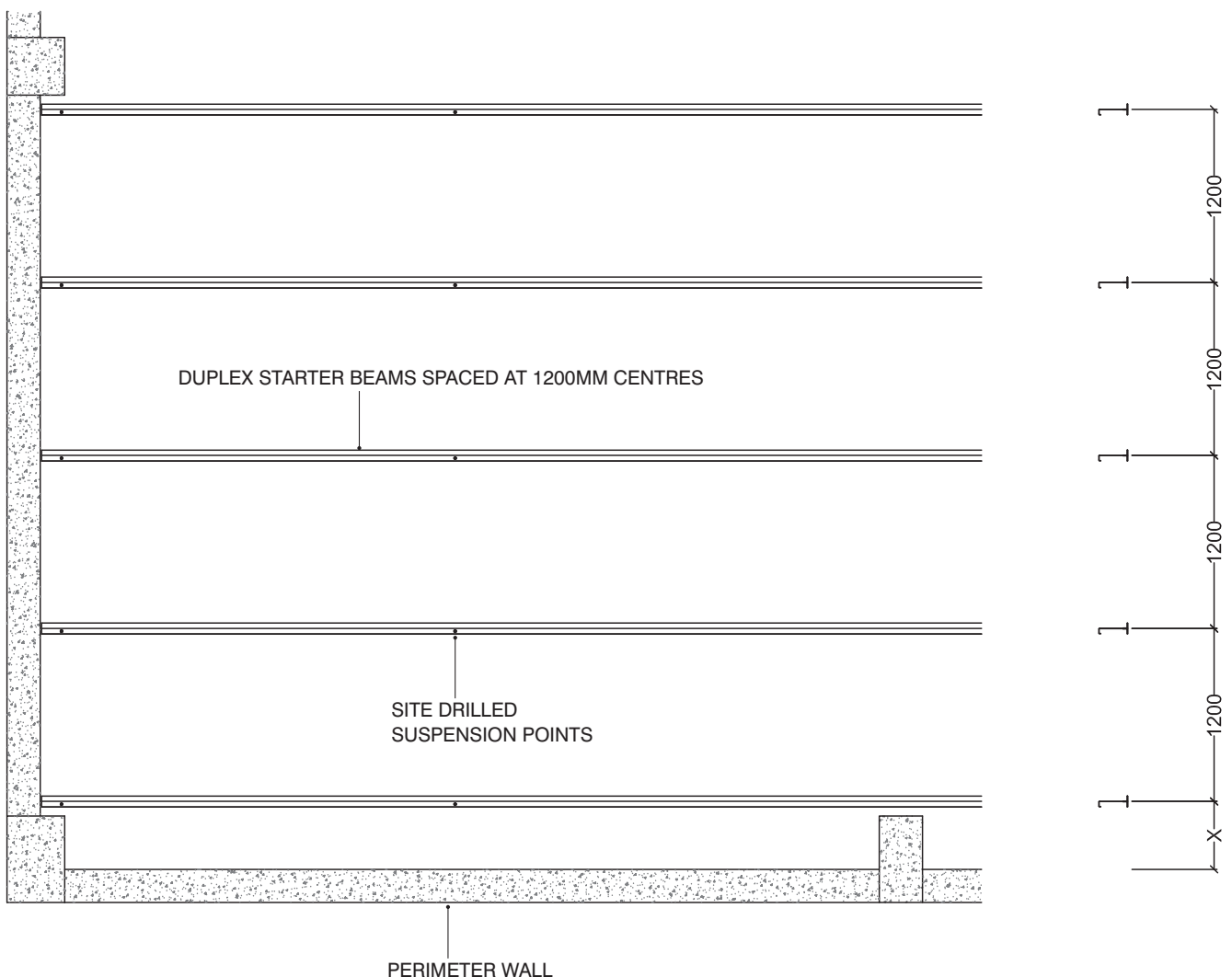
Verges and eaves should be framed to withstand loads imposed by ladders etc. It is recommended that cement sheet clad or Colorbond steel clad Durra Panel is used in all external applications.

Setting Out And Installation Of Ceiling Grid

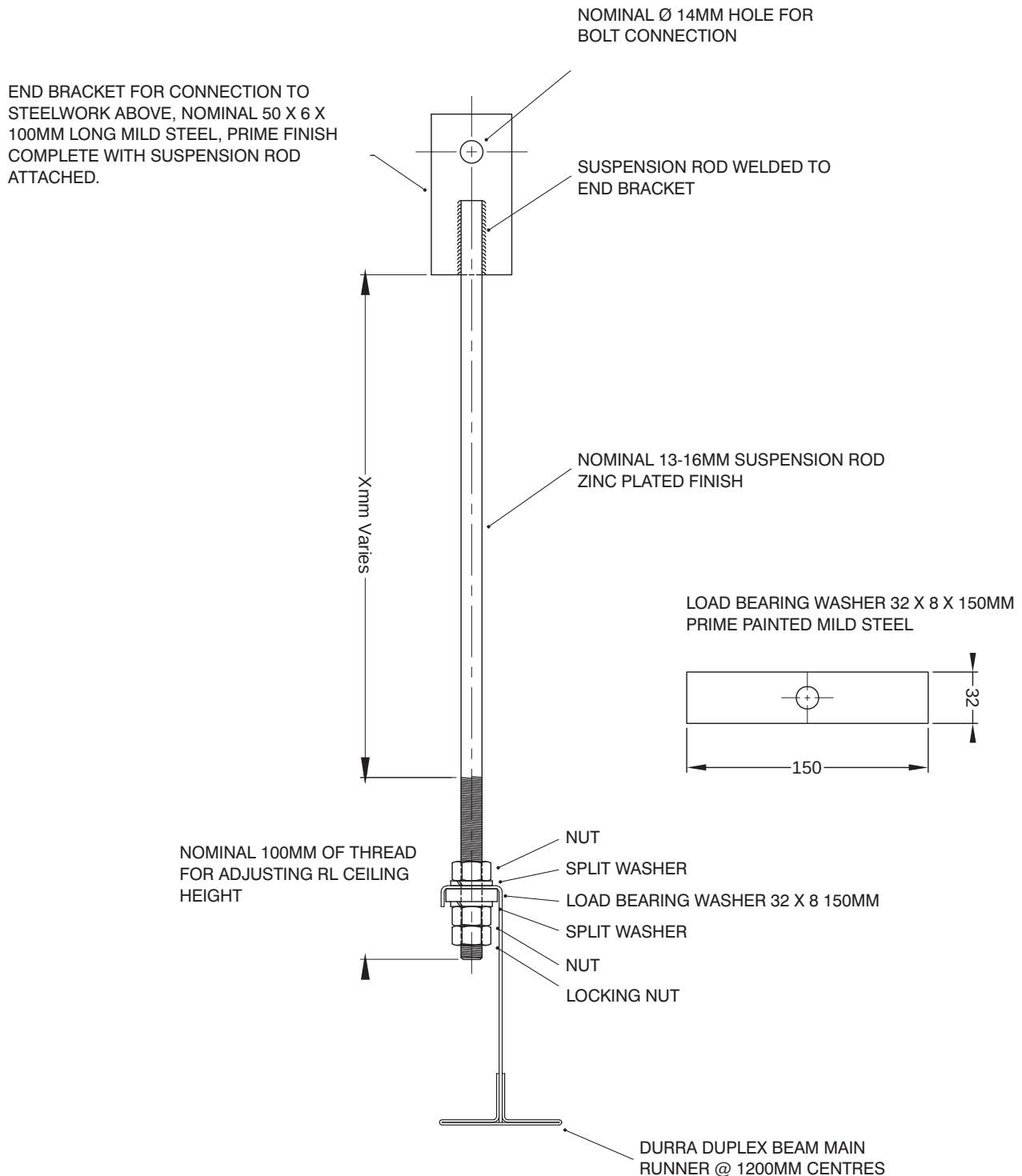
1. The Trafficable Suspended Ceiling Duplex Beam Main Runners are to be spaced at 1200mm centres to form a uniform grid over the entire area.
2. It is of critical importance that the Duplex Beam Main Runners must be spaced accurately and parallel with each other at 1200m centres. We suggest the use of a cross Tee Unit or gauging rod for measurement purposes.



3. The Ceiling grid can be started at any corner location point in the building. We suggest the use of a surveyor to mark out any critical set out points over the ceiling area to ensure that an accurate 1200mm grid is maintained. The marking out survey will also ensure that accurate finishing points are maintained and controlled during the installation process.



The Duplex and I Beam Main Runners are generally suspended from structural steel work above using threaded rod droppers spaced at 1200mm centres. Method of connecting these rods will vary from project to project to suit local conditions. Load bearing washers and locking nuts must be used in accordance with structural engineers requirements to secure Duplex Beams to the rod droppers.

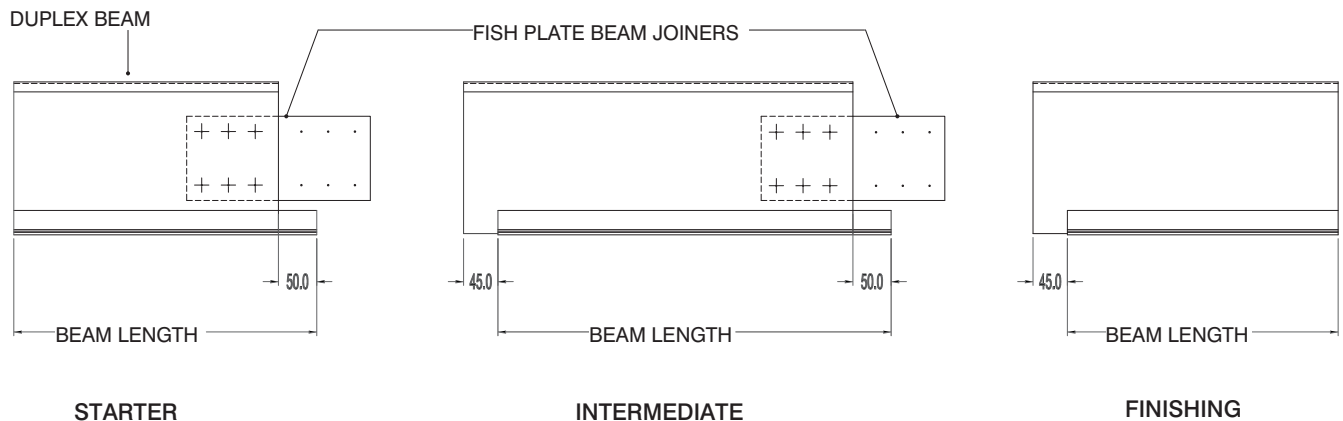


Note: Durra Duplex Beam illustrated in profile above. Durra I Beam profile also available.

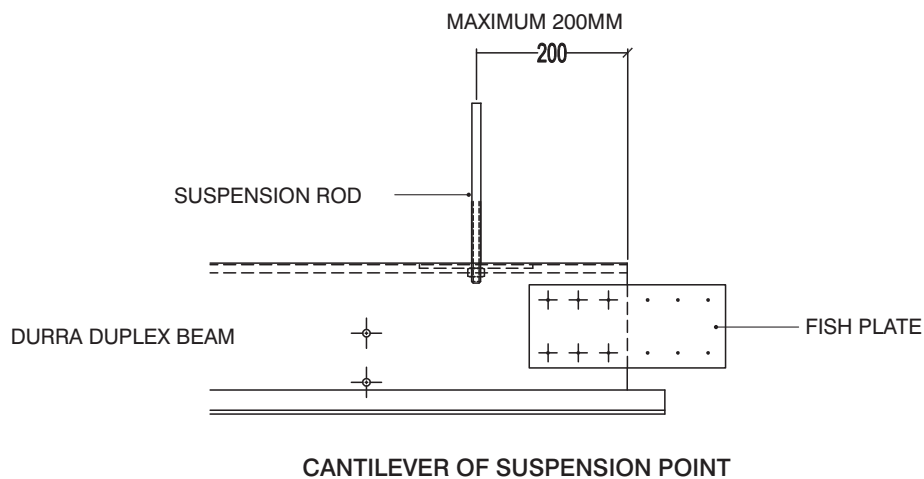
Installation Of Ceiling Grid

1. The Duplex and I Beam Main Runners can be supplied as; Starter Beams, Intermediate Beams and Finisher Beams to form large areas of ceiling grid. Typical assembly details are illustrated below.

Note: Fish Plate joiners can be supplied prefixed to Duplex Beams to enhance the installation process.



Duplex Beams must be joined within a maximum cantilever of 200mm past each suspension point as detailed below.



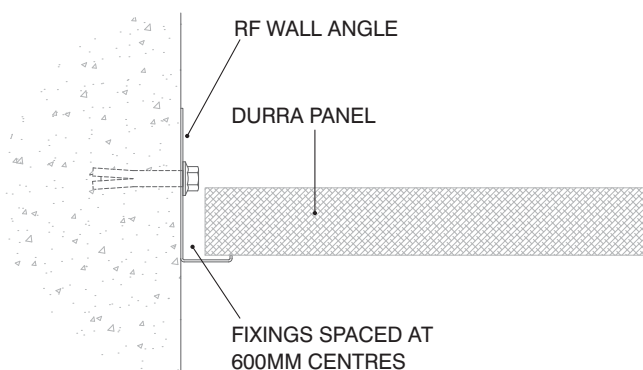
2. Choose a corner of the room that best suits the construction programme and place Duplex Starter Beams on the floor. Site drill the top flange for connection to suspension rods above.
3. Connect and level Duplex Starter Beams to suspension rods with load bearing washers and locking nuts to Engineers Specifications.
4. Connect the Duplex Intermediate Beams to the Duplex Starter Beams using Fish Plate Beam Connectors and fixings provided.

Note: Top flanges of the Duplex Beam Main Runners must all point in the same direction from a starting point. If they point towards each other, Durra Panel cannot be placed into the ceiling grid.

Note: Durra Duplex Beam illustrated in profile above. Durra I Beam profile also available.

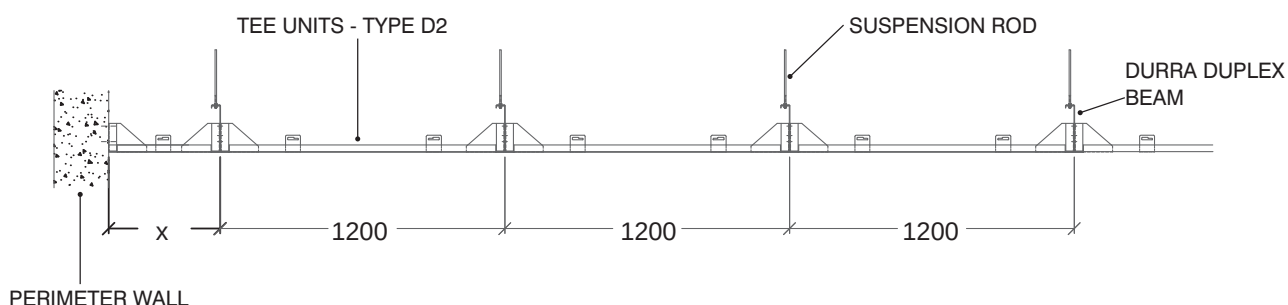
5. After the Duplex Beam Main Runner members have been installed and levelled, the RF Wall Angles can be installed as required to the perimeter of the building. Fixings to be at 600mm centres

Note: Durra Panel is shown for illustrative purposes.



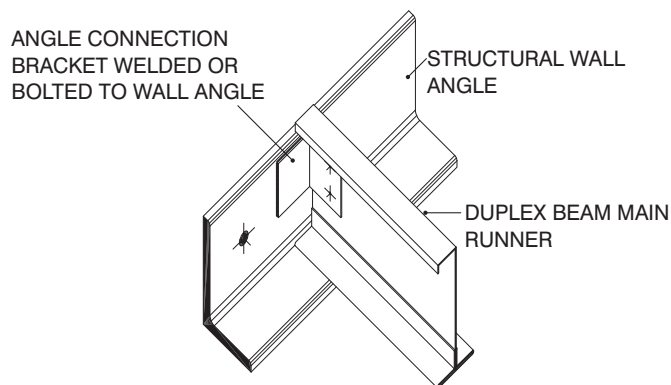
TYPICAL WALL CONNECTION

6. Cross Tee Units are fixed into position between the Duplex Beam Main Runners. Type D Tee Units are fixed into position through pre-punched holes in the Duplex Beam web to suit the length of Durra Panels. For a typical 2000 x 1200mm grid, Durra Panel is supplied at 1976mm in length. (Standard length tolerance deduction of 24mm per panel).



Typical Trafficable Suspended Ceiling Grid

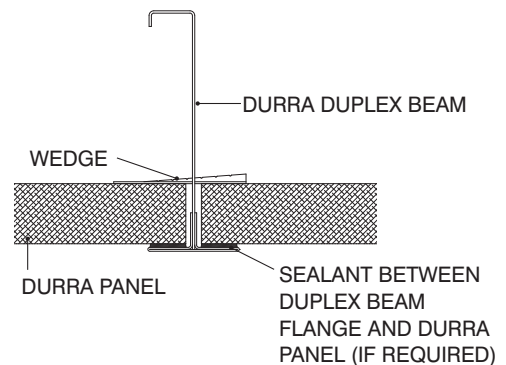
7. Where the Duplex Beam Main Runner is supported by a structural wall angle we suggest either a welded or bolted connection detail using an angle connection bracket.



ANGLE CONNECTION BRACKET DETAIL

8. Durra Panels can now be placed into the Duplex Beam ceiling grid from above. **Durra Panel must not be walked on until Tee Units have been bolted into position.** The installation process requires a forklift truck to lift packs of panels to the ceiling height. Mobile scaffolds are needed to provide access for workers who will lift and place panels into the ceiling grids from above.

Note 1: In some installations a sealant may be required between the Durra Panel and the Tee Flanges. Please check with project specifications.

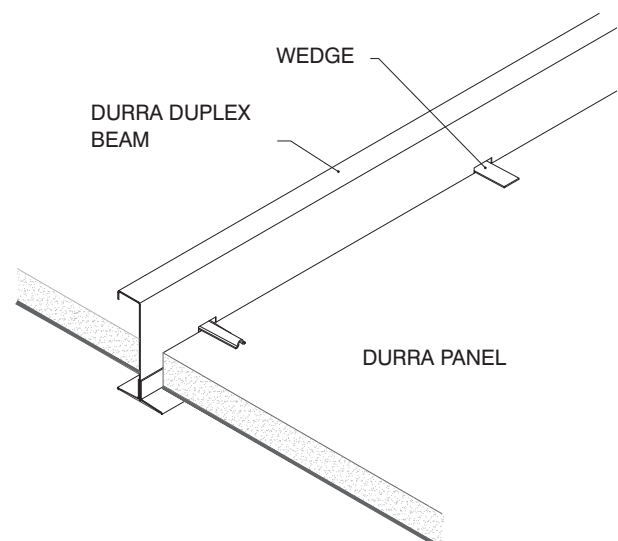


Note 2: It is always recommended to use clean gloves when placing Durra Panel into the supporting grid to avoid dirty marks on exposed finishes.

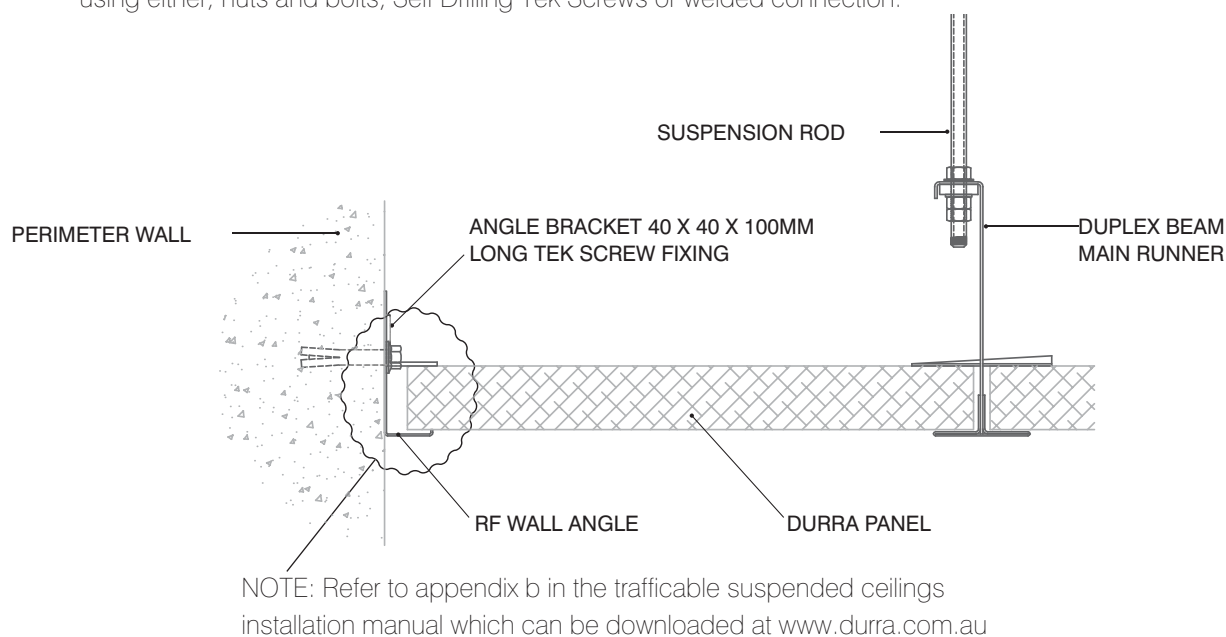


9. Care must be taken not to damage Durra Panel during the installation process. If the kraft panel liner is damaged it must be sealed immediately with Aluminium Sealing Tape.

10. Durra Panel must be secured into the Trafficable Suspended Ceiling grid via wedges slotted through the Duplex Beam webs and Cross Tee Units. These wedges **must be installed in alternating directions** through Tee Units; D2 - 2 No. wedges per unit.



11. Where the long edge of the Durra Panel is supported on a RF (roll formed) Wall Angle at the external wall, it will be necessary to firmly clamp the Durra Panel down against the Wall Angle by use of clamping Angle Brackets. These clamping Angle Brackets are supplied by the builder and must be placed at a maximum of 100mm from each end of the Durra Panel. A typical Durra Panel will require 4 No. Clamping Angle Brackets to securely clamp the panel down into position. The Brackets can be attached to the Wall Angle vertical leg using either; nuts and bolts, Self Drilling Tek Screws or welded connection.



12. Where the Duplex Beam ceiling grid module is spaced at less than 1200mm centres in areas such as the perimeter wall, Durra Panels can be supplied factory cut to widths of less than 1200mm grid. Durra Panel can be cut to length and width on site using power tools - **Refer to Recommended Tools**. Cross Tee Units can be supplied to suit ceiling modules of less than 1200mm grid.
13. Ceiling penetrations can be formed in the Durra Panel either at ground level or after the panels have been placed into the supporting steel grid. Please refer to Section 8 for typical details.
14. Check along perimeter interface between rising walls and the Trafficable Suspended Ceiling. Use a "Flashing" type detail comprising lightweight Colorbond steel (typically 0.55mm BMT thickness), sliding tolerance and a flexible sealant to effectively seal between these two elements of construction.
15. Check the ceiling surface for dirty hand marks and make good with warm water, detergent and clean rags. In more difficult situations use touch up paint where necessary.

General Handling And Storage Information

Handling And Storage - Durra Panel & Durra Steel Sections

Durra Panel is generally packed and delivered to site in pack lots of between ten and twenty sheets per pack. The size of packs is generally determined by the length of the sheet and site conditions. Specific packing requirements can be attended to including plastic wrapping.

Generally the packs of Durra Panel are placed upon timber billets at equal spacing, and banded with metal strapping. All materials can be supplied with grid line marking for site identification purposes.

Duplex Beam Main Runners are generally packaged in a loose interwoven format for hand unloading on site. Cross Tee Units are palletised and shrink wrapped for forklift unloading.

Regardless of which method of handling is selected, it needs to be undertaken in compliance with all Statutory Acts, Legislation, Standards, Codes and Handling Procedures.

(A) Crane

- Packs can be lifted using synthetic slings rated for the load.
- Care should be taken to ensure there is no crushing of panels during the lifting process.
- Special care should be taken to avoid damaging panel corners.
- Chains must not be used to lift packs of; Durra Panel or Durra Steel Sections.

(B) Forklift Or Similar

- Handling by forklift or similar equipment can be undertaken with the fork tines placed directly underside and central of the pack.

(C) Manual Handling - Durra Panel

- Lift and tilt one corner up in order that the other edge provides support to the panel prior to lifting.
- Carry all panels on edge – DO NOT CARRY FLAT
- Remove any surface dirt or grit before re-stacking on a flat surface.
- Avoiding sliding panels.
- The first panel of the stack must be clear off the ground/floor on timber billets (minimum of three per panel).

(D) Storage

- As per manual handling procedures, panels are to be stacked on a flat solid base, the first panel being clear off the ground/floor on timber gluts (minimum of three per panel).
- Store panel under cover in a well ventilated area, protected from ambient moisture, rain and dampness.
- Storage height should be limited to twenty panels for ease of handling.
- Packs of Durra Panel must not be stored in a plastic wrapped, unventilated state for extended periods as sweating may occur, resulting in moisture damage.

Note: Durra Panel packs can be ordered with a shower proof plastic wrapping. This light weight plastic wrapping is only suitable for temporary protection.

(E) Exposure To Weather

Durra Panel is capable of withstanding the elements of sun, wind and rain for a short period of time during the construction process. Care must be taken to make sure that the panels have no damage, cuts or tears.

All cut edges must be sealed with the aluminium foil tape available from Ortech Industries.

Should damage have occurred to the panel, simply apply the reinforced aluminium foil tape to ensure water or moisture cannot gain access to the panel core.



The installation section of this manual has addressed recommended practice for installation of the Trafficable Suspended Ceiling. The following are general notes to assist during the construction process.

Cutting Durra Panel And Durra Steel Sections**(A) Hand Saw**

- Can be undertaken using a timber hand saw coarse cut and in good sharp condition.
- Use the same method as that of cutting any sheet product, supporting the off cut section to prevent damage to the panel.
- Seal all cut edges immediately using the reinforced aluminium foil tape.

(B) Circular Saw Or Other Powered Device

- Durra Panel is a natural safe product with no binding agents or toxins. When cutting or drilling always wear safety glasses and a dust mask.
- Undertake cutting in a well ventilated area.
- When using a circular saw a carbide tipped timber blade is recommended for cutting the straw core of the board. Saw blades must be sharp and in good condition. If laminated with metal, the Colorbond steel sheet face will need to be cut using a grinder with a metal cutting blade. If laminated with cement sheet, the cement sheet face will need to be cut with an abrasive cutting blade.
- Use a straight edge or similar clamped to the board to provide a guide to ensure straight cuts.
- Seal all cut edges immediately using the reinforced aluminium tape provided.
- Reciprocating saws and hole saws can also be used to cut circular holes in Durra Panel.

Cutting Durra Steel Sections

- Cut beams with an angle grinder or drop saw with an abrasive cutting blade fitted.
- In extreme environments apply zinc chromate paint or similar to the exposed cut edges of Durra Steel Sections to resist corrosion.

Recommended Tools

	Reciprocating Saw
	Jigsaw
	235mm(9-1/4") Circular Saw
	Cordless Drill/Driver
	Holesaw Kit
	230mm(9") Angle Grinder

Products Supplied By Others

The following materials are not supplied by Ortech Industries but will be required at the project site in order to construct the Trafficable Suspended Ceiling.

(A) Suspension Rods

- Used to connect the Duplex Beam main runners to the structural steel members.

(B) Connection Brackets

- General purpose connection brackets may be required to connect the Duplex Beam main runners to a variety of structural elements.

(C) Structural Steel Wall Angle

- Structural Steel Wall angle may be used to provide a sliding tolerance at the interface between the trafficable ceiling perimeter and the external building walls.
- A structural element that is provided by the builder.
- Wall angle should provide a minimum of 25mm support for the Durra Panel.

(D) Ceiling Penetrations

- Trims to penetrations through the ceiling system other than Cross Tee Units Type D.
- Reinforcing steel sections for penetrations over 600mm in diameter and for penetrations over 600 x 600mm in dimension.

(E) Sundry Fixing Materials

- Foam Tapes; if specified
- Sealants; if specified
- Fixing Screws
- Packers/Cushion – Used between the structural steel and the Durra Ceiling Panel if required as a cushion behind the flexible sealant.
- Clamping Angle Brackets – Used to clamp the Durra Panel down against structural elements such as perimeter wall angles. Angle Brackets are used where it is impractical to use the Durra wedges.

Section 5

Durra Lifting Frame Panelised Installation System

Introduction - Panelised Roof / Ceiling And Wall.....5.1.1

Features And Benefits.....5.1.1

Installation Procedure: Overview.....5.2.1

Installation.....5.2.2

Installation: Panelised Wall Construction.....5.2.7

Durra Lifting Frame Projects.....5.3.1

NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Introduction - Panelised Roof / Ceiling And Wall Systems

The Durra Lifting Frame is an innovative panelised installation system developed for use with Durra Panel and Durra Steel Sections (roof purlins and wall girts) to save time, cost, and improve the safety of workers on site.

Developed by Ortech Industries, the Durra Lifting Frame is at the forefront of panelised ceiling and wall system installation on commercial and industrial building sites in Australia and overseas. Construction companies have been attracted to it due to increased site safety, ease of use, and valuable time saving efficiencies.

One of the main challenges for the construction industry is overcoming the safety issues associated with working at heights for the installation of steelwork, ceilings, roofing, wall lining and cladding. The combination of Durra Panel, Durra Steel Sections and the Durra Lifting Frame provide the following features and benefits for a better building outcome;

Features And Benefits

Roof Safety Mesh - Not Required

Durra Panel is a strong, solid and rigid building material that can be safely walked on during the construction process. With 25mm of perimeter support, Durra Panel will safely support work men carrying hand or power tools and other installation equipment. Safety mesh is not required with the Durra Panel roof/ceiling system. Durra Panel installed between Durra Steel Sections eliminates the cost and risks associated with installing safety mesh at height while at the same time providing personal protection to workers below from falling tools above.

Roof Purlin Insulation Spacers - Not Required

With no need for a taut safety mesh over the Durra Steel Sections, bulk insulation blanket can be installed so that it maintains its thickness between supports and comply with the manufacturers stated R Value.

Safe Installation

The assembly of roof/ceiling and wall modules is undertaken in a safe and controlled ground based assembly environment. Handrails may be installed to the roof/ceiling modules prior to crane hoisting. Roof and wall cladding can also be fitted at ground level provided that the sheeting is not longer than the lift assembly dimension. The modules are then crane hoisted into position using the Durra Lifting Frame. Workers in elevated work platforms bolt the module to the structural steel. When the module is secure the Durra Panel provides a safe and trafficable work platform to enhance the roof installation process.

Fast Installation - Preassembly

The panelised assembly process for roof/ceiling and wall modules can start on site prior to the erection of structural steelwork.* Typically, a module of approximately 100M² in area can be assembled and placed by a team of 5-6 men in one hour. The completed modules can be stacked on top of each other in readiness for the completion of structural steel work. This system of installation maximises the efficiency of crange and compresses project build time.

* Not to be used for estimating purposes. Installation time may vary up or down depending on site conditions.

Features And Benefits Continued

Applications

- Horizontal - Roof or Ceiling
- Pitched - Roof or Ceiling
- Curved - Roof or Ceiling
- Vertical - Wall
- Floor

Thermal Insulation

Durra Panel is a multi use construction material that exhibits beneficial thermal performance. A typical Durra Panel roof ceiling assembly comprising; Durra 250 Steel Section, S50 Durra Panel, 80mm glasswool blanket (with RFL), and a 120mm unventilated reflective air space: AS/NZS 4859.1:2002 = R 4.21 Summer (downward heat flow). Thermal performance can be varied by subtracting or adding bulk insulation to the on ground assembly prior to crane hoisting.

Acoustic Performance

Durra Panel roof / ceiling, wall and flooring systems deliver cost effective solutions to a wide range of acoustic problems. Durra Panel finishes can be varied to suit specific project needs with both sound absorption and sound transmission loss being provided by the one clever product.

Certification

The Durra Lifting Frame is a Certified Lifting Device, and is delivered to site complete with Engineering Certification and Service Plate attached.

Walking On Panels

With just 25mm of perimeter support, Durra Panel will safely support workmen carrying hand or power tools or other installation equipment. Avoid stacking other building materials or equipment on panels and avoid point loading such as ladders, scaffold poles etc. **Durra Panel must not be walked on until Tee Units have been bolted into position.**

Stacking Assembled Modules

Assembled modules can be stacked on top of one another on suitable level ground, recommended maximum of 6 modules high. It is also recommended that tarpaulins be used to weather proof each stack of modules if they are to be stored on site in readiness for crane hoisting.

Environmental

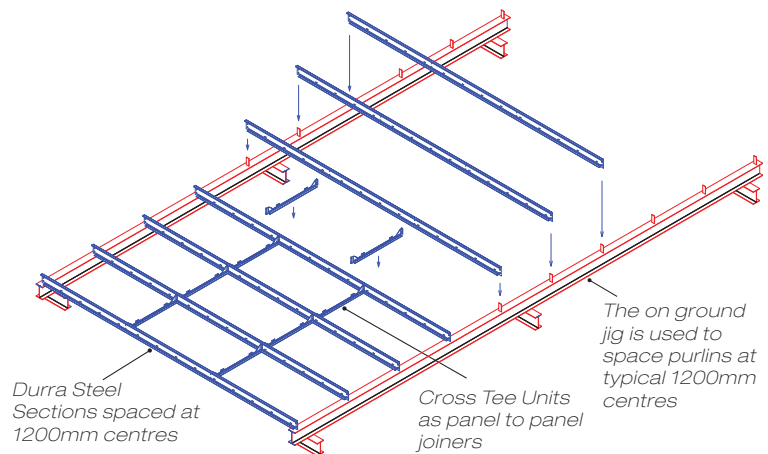
Durra Panel is produced using a unique dry extrusion process that converts a natural and plentiful resource; wheat or rice straw fibres into durable construction panels. The low energy manufacturing process requires no water or gas and is completely free of chemical additives, or binding agents. The result is an economical multi use construction material that is 100% biodegradable at the end of its useful life - an environmentally preferable product.

Installation Procedure: Overview

1. Assemble the ceiling / wall or floor module on ground. Durra Steel Sections are placed on to the on ground setup jig; tee units are added to complete the two way grid Purlin system.

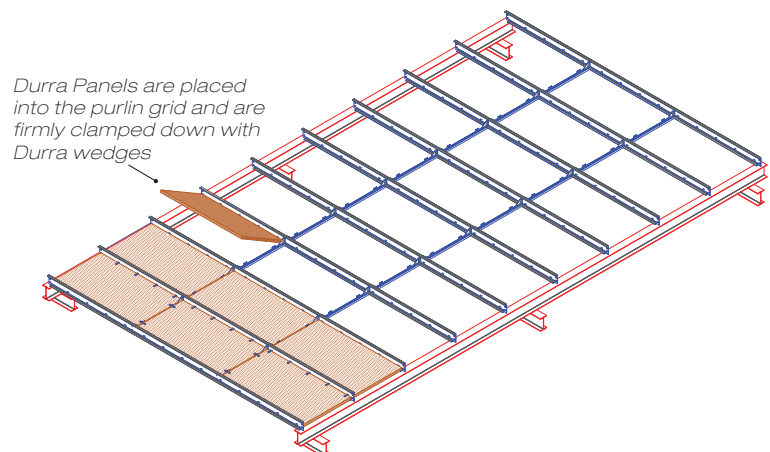
Note: Set out jig supplied by others.

2. Place Durra Panels into the Steel grid to complete the module. Lock panels down with Durra Panel Wedges. **Note:** Completed modules may be stacked on top of each other to save site space and also enhance the installation process.



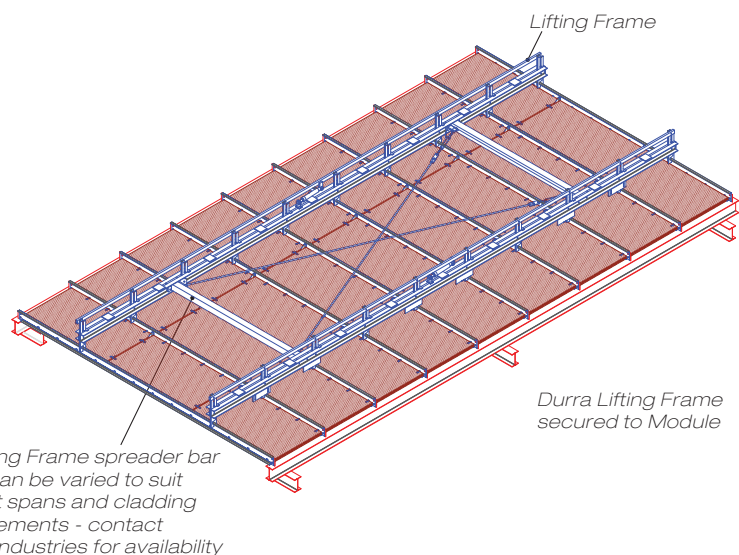
3. Safety handrails can be attached directly to the Durra Steel Sections prior to lifting of the modules. **Note:** Safety handrails supplied by others.

4. The Durra Lifting Frame is craned into position over the completed module and attached using the hydraulically operated scissor connectors. **Prior to lifting, inspections are carried out to ensure correct assembly and safety.**



5. The module is hoisted into position above the building structure and rotated into place by using control lines attached to the Lifting Frame.

6. The module is aligned with cleats and lowered into position. Standard cleat bolts are inserted and tightened to secure the module to the steel structure. **Once the module is secure, it becomes a safe trafficable work platform.**



7. The Durra Lifting Frame is then disengaged and returns to the assembly area to pick up the next module.

Installation: Module Assembly



Assemble Module

Durra Steel Sections are placed into position on the ground setup jig; tee units are bolted into place to complete the two way grid.



Fit Durra Panels

Durra Panels are fitted into the two way grid to complete the module.



Secure Durra Panels

The Durra Panels are locked down using Durra Panel wedges that are hammered in alternating directions through pre-slotted holes in the Durra Steel Sections.

5.2.3

Durra Lifting Frame

Stacking Modules

Completed modules may be stacked on top of each other to save site space and also enhance the installation process.

Following assembly, the modules can be moved around the site as need be to storage or staging areas using a Franna type of mobile crane.



Penetrations (if required)

A variety of penetrations can be placed into the module during or after assembly. Support hangers for general services may also be connected to the Durra Steel Sections prior to lifting.

Please note: Any newly cut edges of Durra Panel must be sealed with aluminium or board sealing tape, specified by Ortech Industries.



Fixing Handrail

Safety handrail can be installed at ground level prior to crane hoisting. Safety scaffolding posts can be attached directly to the Durra Steel Sections and then handrails attached to the posts.



Installation: Durra Lifting Frame



Position Durra Lifting Frame

The Durra Lifting Frame is craned into position over the completed module (approx 100m²) with the scissor connectors set to the **open** position. There are 2 connectors for each Durra Steel Section.

Spreader bar length of the Lifting Frame may be varied to suit the on ground installation of metal cladding material; contact Ortech Industries for availability when placing your Purchase Order.



Secure Durra Lifting Frame

The Durra Lifting frame is aligned over the module and lowered into the connection plane. The scissor connectors are then **closed** with a hydraulic ram, which is located on each side of the Durra Lifting Frame. A fail safe pin is inserted to complete the connection process.

NOTE: Minimum clearance of 25mm is required between top face of Durra Panel and underside of fixed scissor connectors to enable opening and closing.



Separation

A final inspection is carried out to ensure that the assembly is complete and ready for crane hoisting. The module is now ready for separation from the on ground jig.

5.2.5

Durra Lifting Frame

Visual Inspection

The module is lifted from the ground jig to a height of approximately 2 metres for visual inspection before crane hoisting. A control line is attached to the corner of the Durra Lifting Frame for alignment purposes.



Adjusting Angle

The level of the module may be adjusted to a variety of pitches to suit the angle of the structural steel.

The Lifting Frame is also suitable for curved and vertical applications. Please refer to Ortech Industries for further detail.



Lifting Into Position

The ceiling module is hoisted into position above the building structure and rotated into place by using the control lines attached to the Lifting Frame.

The module is aligned with the cleats and lowered into position. Standard cleat bolts are inserted and tightened to secure the module to the steel structure.



Installation: Durra Lifting Frame



Trafficable Platform

Once the module is secure, it becomes a safe trafficable work platform.



Disengage Durra Lifting Frame

The fail safe pin is removed and scissor connectors are opened for separation. The Lifting Frame disengages and returns to the assembly area to pick up the next module which is readied for hoisting.

Installation: Panelised Wall Construction



Durra Vertical Lifting Frame

This frame works for our acoustic wall, ceiling and flooring systems. Note that the external cladding, down pipes and gutters can now be attached to the wall module on ground prior to lifting; nominal dimensions of this lift; 7.2 x 12m high.

Spreader bar length of the Lifting Frame may be varied to suit the on ground installation of metal cladding material; contact Ortech Industries for availability when placing your Purchase Order.



Modules bolted to structural steel columns with cleat connections. Dimensions of lift modules can be varied to suit spacing of structural steel members.

5.3.1

Durra Lifting Frame

Projects

Northern Water Treatment Plant: NWTP

The NWTP is an advanced water treatment facility located near Wandoan in far North Queensland. The plant will have capacity to purify 100 million litres of water per day.

Construction of the Main Process Building was on a critical path time line and site safety an imperative considering the 16M high roof and walls. Durra Acoustic Panel, Durra Steel Sections (roof purlins and wall girts) and metal cladding were assembled on ground into large modules (9M wide x 16M long) and then crane hoisted into position using the Durra Lifting Frame. The 5000m² building envelope including the acoustic lining was completed in less than three weeks. A significant outcome and mile stone for Durra Panelised Building Systems

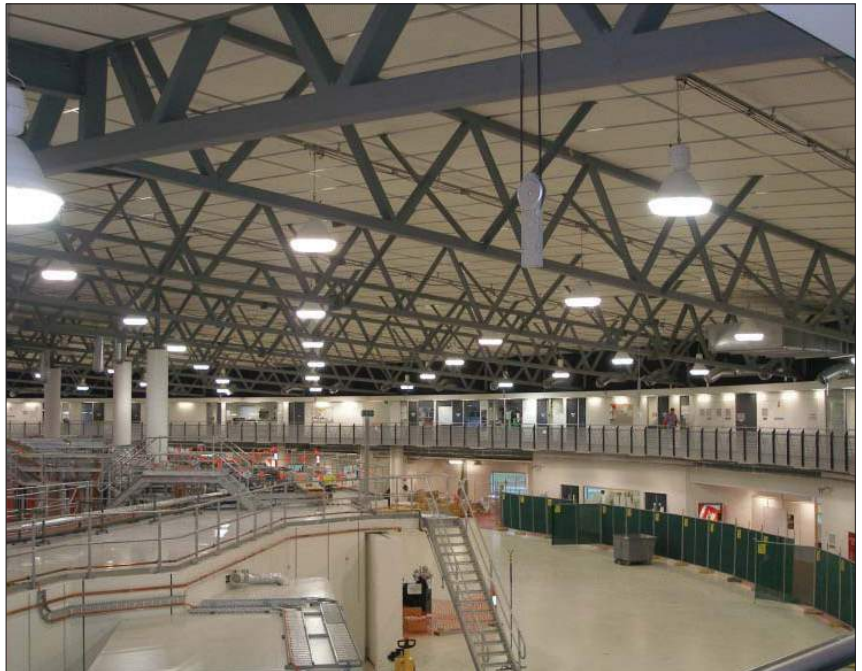


Projects

Australian Synchrotron

A state of the art Victorian Government sponsored scientific facility for the study of physical elements at the sub atomic level. A challenging 206 million dollar construction project with 11,000m² of circular roof area. Construction time lines were highly critical and largely dependent on how quickly and safely a roof could be installed to obtain weather protection.

Ground based assembly of pre finished Durra Panel and Durra Steel Sections into large panelised modules were lifted into position with the Durra Lifting Frame.



Website: www.synchrotron.vic.gov.au

Projects

Melbourne Convention Centre

The first convention centre to be awarded a 6 Star Green Star environmental rating, Melbourne Convention Centre also had a high acoustic demand to control low frequency noise from a near by helicopter pad. A three part (22,400m²) Durra roof and ceiling system created an acoustic envelope to block out the noise.

Large modules of Durra Panel and Durra Steel Sections were assembled on ground in a state of readiness for the completion of structural steel and then crane hoisted onto the structure using the Durra Lifting Frame.



Website: www.mcec.com.au

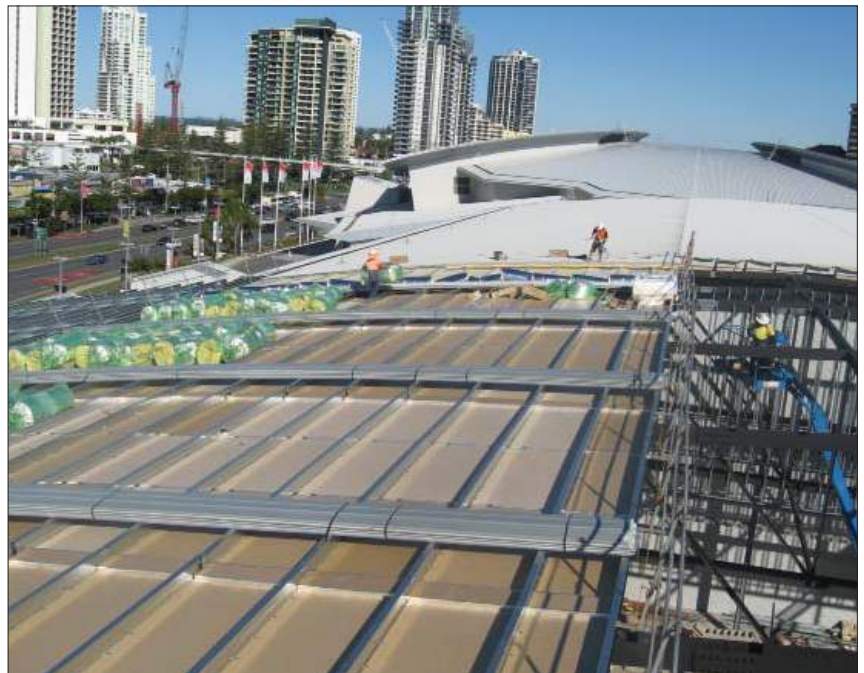
Development: www.mccd.vic.gov.au

Projects

Gold Coast Convention Centre

The Gold Coast Convention and Entertainment Centre conveniently located in the heart of the Gold Coast, features a Main Arena, Exhibition Halls, and Meeting Rooms catering for 10 to 6000 people. A challenging project with a highly complex roof geometry. A Land Mark 14,000m² project for Queensland and the Gold Coast.

Durra Panel Black Soundsorb Finish, and Durra Steel Sections delivered a high performance acoustic roof/ceiling system that was assembled on ground and crane hoisted into position using the Durra Lifting Frame



Website: www.gccec.com.au

Projects

Acoustic Building Enclosure - Tunneling

To allow construction of the Brisbane North South Bypass Tunnel, a demountable Acoustic Shed was required at the mouth of the tunnel to act as a sound barrier during the removal of rock and earth. With nearby residential areas, the Tunnel shed required a minimum Rw 48 rating.

Durra Panelised wall and roof assemblies were used to enhance build time and increase site safety for workers.



Projects

Victorian Desalination Plant

This Land Mark Project was featured on Discovery Channels Build it Bigger programme. The largest desalination plant in the Southern Hemisphere. A challenging construction timeline required safe panelised pre-assembly solutions for the acoustic roof. Large 100M² modules of Durra Panel and Durra Steel Sections were constructed on a ground based assembly line and then crane hoisted onto the Structure using the Durra Lifting Frame; over 400 lifts of pre finished roof / ceiling assemblies.



Projects

Perth Arena

A world class, indoor, multi-purpose, all weather arena that caters for sports and entertainment, even theatre or an intimate concert. Perth Arena was a cutting edge challenging design that required the highest levels of acoustic performance. The combination of Durra Panel, Durra Soundsorb Cassettes and Durra Steel Sections were specified for use due to the safe, cost-effective method of ground based panelised installation using the Durra Lifting Frame.



Projects

Queensland State Tennis Centre

The State Tennis Centre at Tennyson (QLD), includes a 5500 seat international standard centre tennis court and 23 standard match training courts. The installation of approximately 5000m² of a Durra roof/ceiling system was completed in three weeks; safely, ahead of program and under budget with the use of the Durra Lifting frame panelised system of installation.



Projects

Melbourne International Airport

The Terminal 2 Gates and Cross Concourse expansion project included dual-level aero bridges to accommodate the A380 "Superjumbo" aircraft. Stage 1 of the T2 redevelopment included over 7000m² of the Durra acoustic roof / ceiling system that was installed in pre assembled panelised modules using the Durra Lifting Frame. The methodology of ground based assembly enhanced site safety for workers and compressed the project build time.



Projects

School Buildings Performing Arts Centres Sports Stadiums

Durra Panel roof, ceiling and wall systems are ideal for use in; school buildings, performing art centres, trade training facilities, and sports halls. Durra Panel combines the desirable properties of strength, thermal and sound insulation together with a high degree of fire resistance. There are a large range of factory applied finishes available to suit individual project needs.

Durra Panel building systems are safe, fast and economical to install with significant design flexibility in a wide range of applications as illustrated on this reference page.



Section 6

Wall Systems

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NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Introduction



Durra Wall panels are produced through a unique dry extrusion process that densely compresses wheat or rice straw fibre into high quality, durable and fire resistant construction panels. There are no chemical binders added during this innovative manufacturing technology that produces zero toxic waste.

Durra Wall Panels may be used on their own as non load bearing partitions, or be fixed back to framework using a combination of aluminium sections to conceal perimeter fixings.

Durra Wall panels have square edges and are produced in two thicknesses; S50 (nominal 50mm thick) and S58 (nominal 58mm thick). The panels can be ordered with pre

formed and centrally located slots down each long side. A patented self aligning biscuit connector is placed into each slot before bringing the panels together to form the panel to panel joint.

Residential And Commercial Applications

Durra Wall panels are ideal for use as an internal lining to the external framework of buildings. The combination of Durra Panels; thermal mass, thermal insulation and a reflective external wall air space will assist with lowering running costs associated with winter heating and summer cooling - **The reverse brick veneer principle of construction.**

Durra Panel is a natural product and is not as smooth as plasterboard in appearance. The Durra Panel paper liner finish can be painted, (we recommend the use of textured or flat finish paints) wall papered, or alternatively lined with plasterboard sheeting.

Durra Wall panels may also be used as either single or double skin non load bearing internal walls; self supporting between top and bottom fixings for heights up to a recommended maximum of 2.7M without the need for any additional framing.

Industrial Applications - Stick Build Or Modular Pre-Assembly

Durra Wall panels can be stacked up panel by panel and mechanically fixed back to C or Z wall girts as an internal acoustic and thermal lining material. The jointing systems can be varied to suit aesthetic and performance requirements; generally Durra Panel with biscuit connections and perimeter fixings concealed with a variety of aluminium or steel top hat clamping sections. See Reference 6.2.6.

Durra Wall panels can be combined with Durra Steel Section wall girts for on ground assembly into large nominal 100m² wall modules that are crane hoisted into position using the Durra Lifting Frame. The modules can often be fitted with gutters, down pipes and wall cladding on ground prior to crane hoisting.

Durra Wall panels can be supplied with a variety of face finishes and laminates (cement sheet, plywood, metal and a wide variety of sound absorbing facings) to suit specific needs.

Inbuilt Benefits

Environmental

With today's focus on; Sustainability, Low Carbon Technology and Preferred Environmental Choices, Durra Wall panel is the perfect choice for use in a wide and diverse range of wall systems. Durra Panel is produced using a unique dry extrusion process that converts a natural and plentiful resource; wheat or rice straw fibres into durable construction panels. The low energy manufacturing process requires no water or gas and is completely free of chemical additives, or binding agents. The result is an economical multi use construction material that is 100% biodegradable at the end of its useful life - an environmentally preferable product

Sound insulation

Durra Wall panels have a natural sound deadening quality and provide an excellent insulation barrier against sound transmission from one side of a wall to the other. Durra Wall panels have an excellent track record for isolating noise in; studios, cinemas, home theatres, airports and industry.

Fire Resistance

Durra Wall panel has a proven reputation for fire resistance. The carbonising action of the panel core when exposed to flame retards fire penetration. With a fire rated panel to panel joint, Durra Panel has a one hour Fire Resistance Rating

Thermal Insulation

Durra Wall panel combines the desirable properties of thermal insulation and thermal mass. The panels on their own, will reduce the rate of heat transfer from one side to the other while at the same time acting as a form of thermal battery storage unit producing a warmer house at night in winter and a cooler house during the day in summer. For a more detailed thermal performance analysis see Section 2 Thermal Performance.

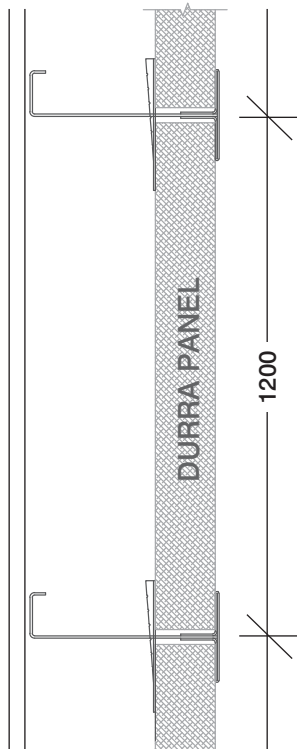
Impact Resistance

Durra Wall panels are highly impact resistant and exceptionally robust. They are not subject to impact damage. A single panel is 10 times more impact resistant than conventional impact resistant plasterboard sheeting.

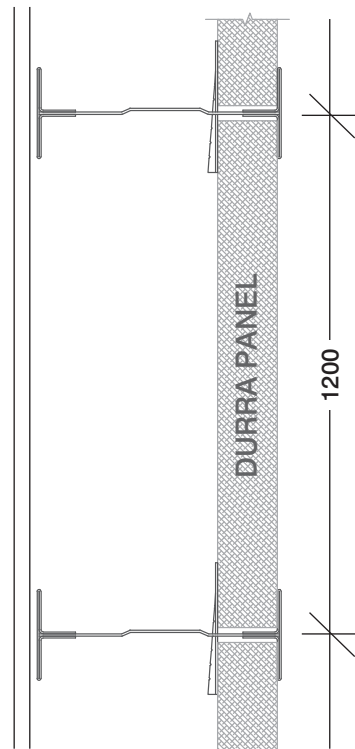
Ground Based Panelised Assembly

Durra Panel And Durra Steel Sections

DUPLEX BEAM GIRTS



I-BEAM GIRTS



DURRA LIFTING FRAME

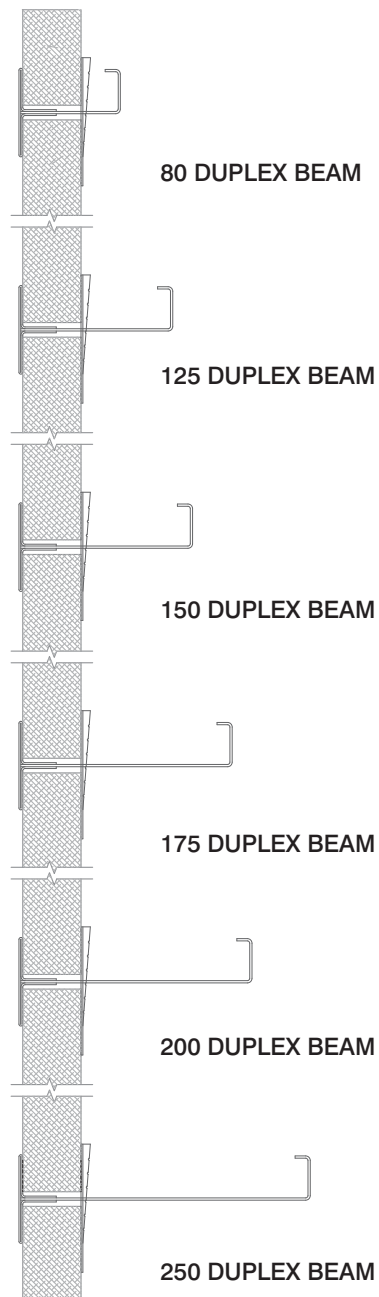


DURRA LIFTING FRAME

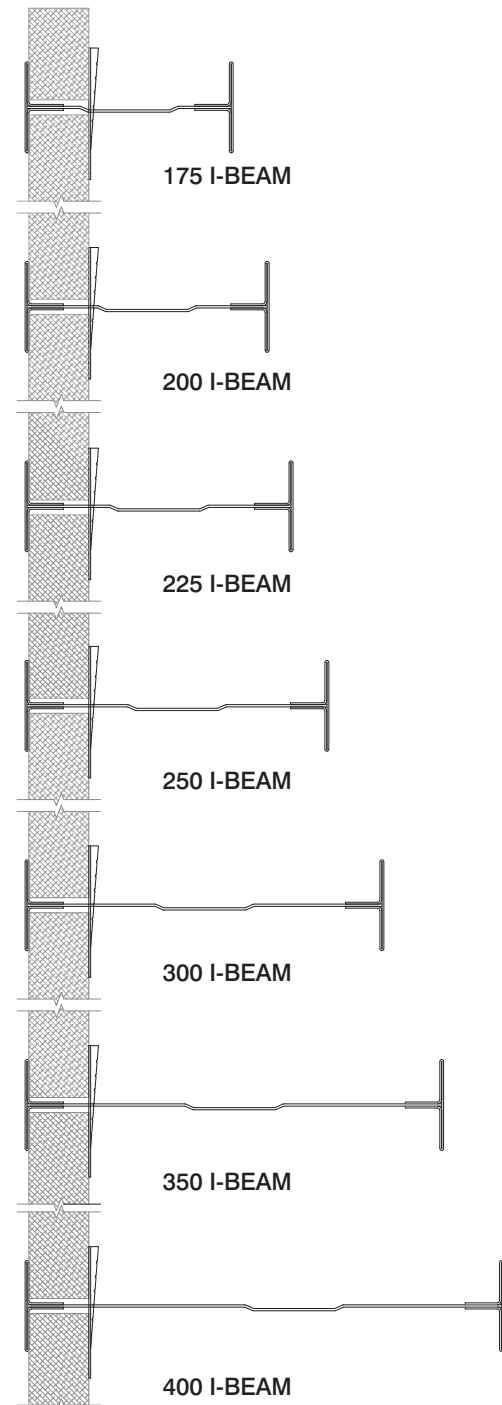
Visual Reference Chart - Durra Panel And Durra Steel Sections

Durra Wall Systems

DUPLEX BEAM GIRTS

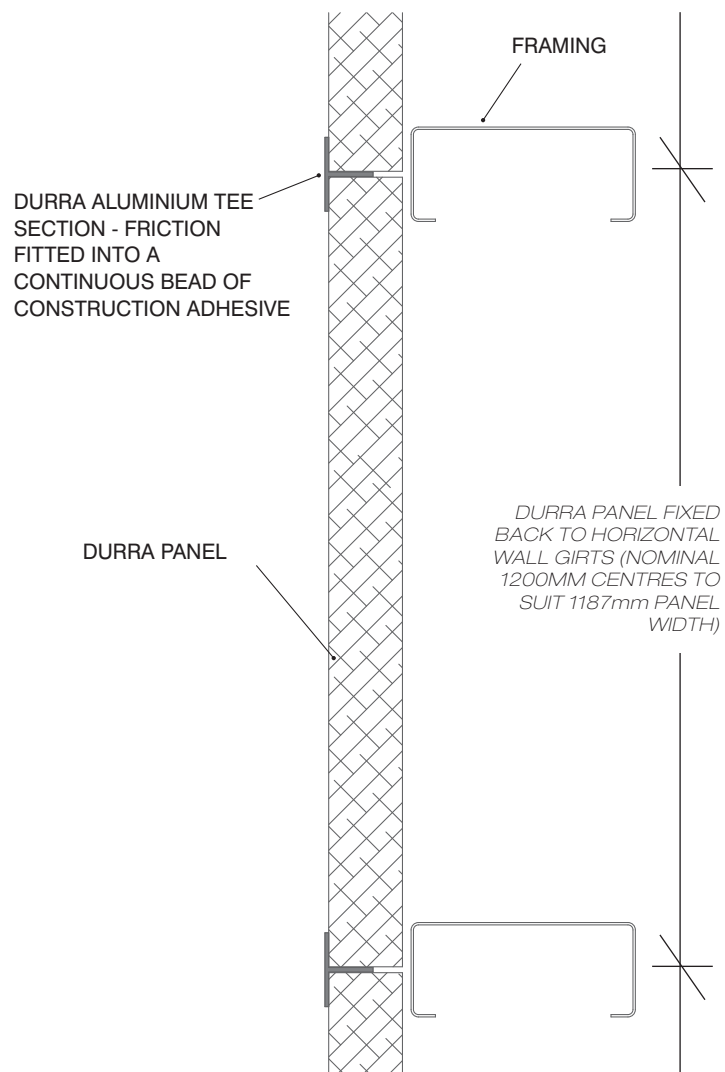


I-BEAM GIRTS



Durra Panel Face Fixed To Framework

Durra Panel S50 And S58

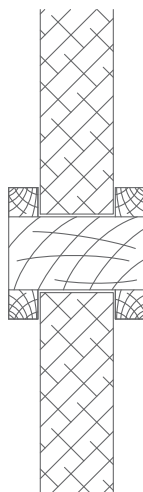


Durra Panel Partition Walls

Durra Panel S50 And S58



*Double
Channel
(Demountable)*



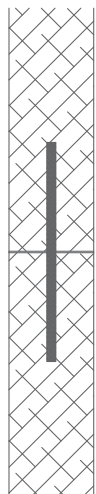
*Infill Panel
(Demountable)*



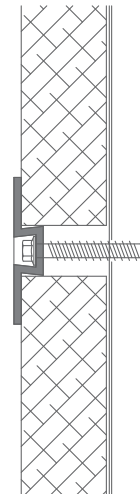
*Partition Board
suit standard A6
Snaplock section
(Demountable)*



*Durra Wall Panel
S58 caulk jointed*



*Durra Panel Wall lining
fixed back to structure
caulk jointed*

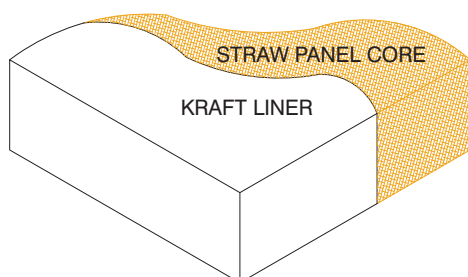


*Durra Panel Wall lining
fixed back to structure
using A6 Snaplock
section (Demountable)*

Durra Panel Specifications



Durra Panel Partition Wall - Commercial Office



Durra Panel S50



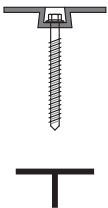
Product Name	Durra Panel S50 Plain
Nominal Thickness	50mm
Weight	18.5 kg/m ² (nominal)
Width (Standard)	1187mm
Maximum Length	3600mm
Face Colour	Brown (Kraft liner)
* Strength	Point load 5.8kN
Impact Resistance	High
Thermal Conductivity	0.081 W/mK
Thermal Resistance	0.62 m ² W/k
Specific Heat Capacity	1050 J/kgK
Embodied Energy	12.6 MJ/m ²
VOC Emission rate (ASTM D5116)	<0.05 mg/m ² /hr (7 days)
Biscuit Slots	Available

Durra Panel S58

Product Name	Durra Panel S58 Plain
Nominal Thickness	58mm
Weight	22 kg/m ² (nominal)
Width (Standard)	1187mm
Maximum Length	3000mm
Face Colour	Brown (Kraft liner)
* Strength	Point load 5.8kN
Impact Resistance	High
Thermal Conductivity	0.081 W/mK
Thermal Resistance	0.72 m ² W/k
Specific Heat Capacity	1050 J/kgK
Embodied Energy	12.6 MJ/m ²
VOC Emission rate (ASTM D5116)	<0.05 mg/m ² /hr (7 days)
Biscuit Slots	Available

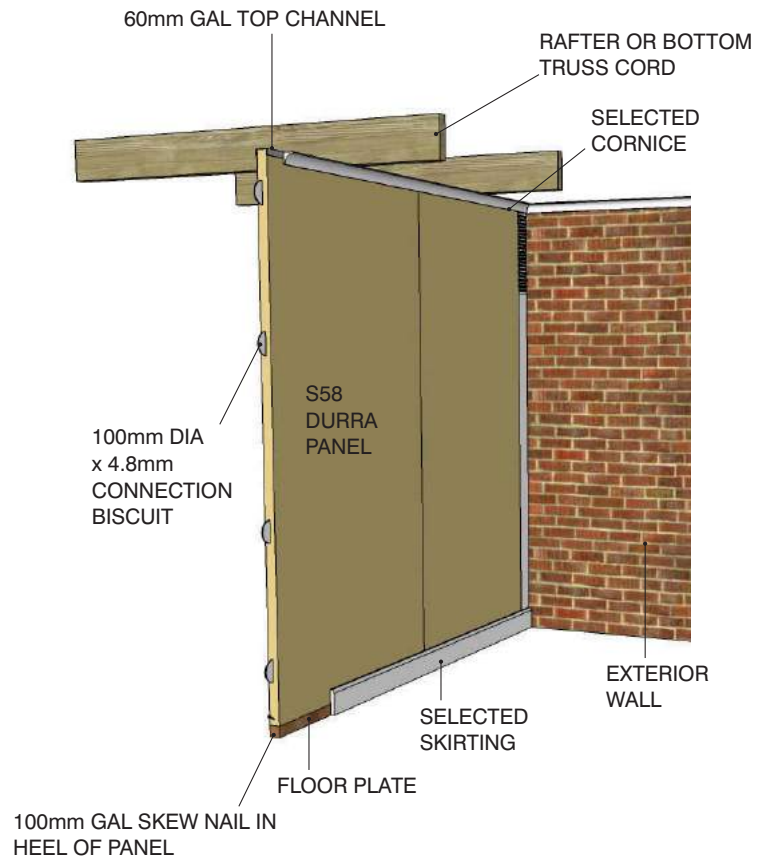
* Note : Point load testing at mid span of S50 Durra Panel Plain Finish supported by Durra Steel Sections spaced at 1200mm centres.

Accessories

ACCESSORY	PROFILE	APPLICATION
BISCUIT CONNECTOR		Durra Biscuit connectors are 100mm in diameter and form a dry mechanical joint between adjacent Durra Panels. Durra Wall Panel may be supplied complete with Biscuit slots and connectors, please specify when ordering.
WALL TRIMS - POWDER COATING AVAILABLE		A6 Snaplock Aluminium Section - Coverstrap to restrain Durra Panel Aluminium Tee Section - To conceal fixings. Friction fitted into a continuous bead of construction adhesive.
HEAD FIXINGS		A variety of deflection head details can be used to secure the top fixing of Durra Panel. We recommend standard industry practise.
ADHESIVE	N/A	A proprietary brand wallboard adhesive is used in conjunction with the Biscuit connectors to form the vertical panel to panel joint.
ALUMINIUM SEALING TAPE		Aluminium self adhesive tape, supplied by Ortech Industries for re-sealing any cut ends of panels - Refer to section 1.3.8 for further information on the Durra Panel Resealing Procedure.

Partition walls: Installation

1. Set out floor plate and fix into position.
2. Plumb up to determine head positions. Fix noggin as necessary. Fix Durra Top channel into position.
3. Mark out positions of panels and door openings on floor plate.
4. Cut panels as necessary.
5. Seal all cuts with proprietary tape.
6. Apply vertical perforated angle stops to exterior wall.
7. Pack if necessary and nail to Durra Wall Panel.
8. Skew nail base of panel to floor plate.
9. Apply adhesive to free edge of Durra Panel and to Durra Biscuit connectors.
10. Slide next panel into position. Pack if necessary and engage Durra Biscuit connectors into the receiving groove.
11. Check against mark on floor plate.
12. Ensure tight fit at joint, then secure the joint with 1No. 8 gauge x 40mm long counter sunk screw through each Durra Biscuit connector.
13. Tack door frames into position for later adjustment and fixing.
14. Complete partition run.
15. Caulk joints in panels with paintable flexible sealant.



Setting Out

The first stage of installation is the setting out and fixing of timber floor plates. Working from the plan, set out the job by cutting and fixing the floor plate to the floor. Fixing is by nailing, screwing or shot firing depending on the type of floor, at approximately 400mm centres.

Care should be taken to accurately line up the floor plate with a straight edge line, particularly where it is cut to form a door opening.

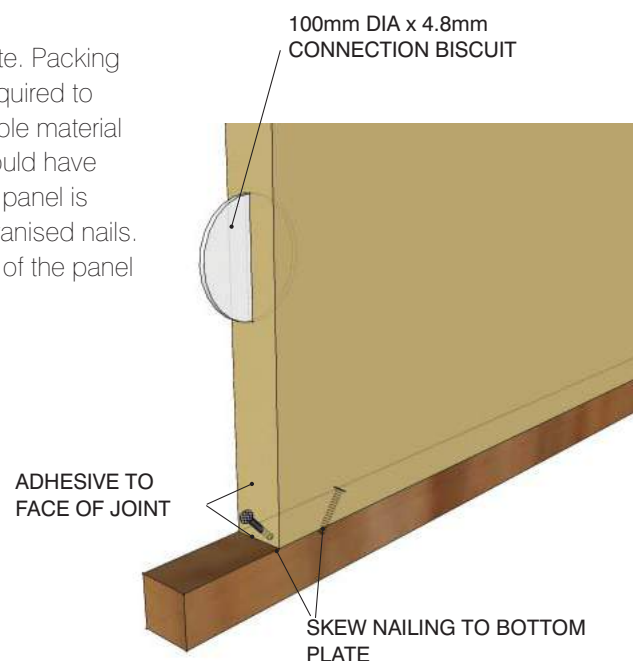
Plumb up from the floor plate to determine the head position and fix any battens necessary to provide a firm fixing for the head channel. A variety of fixings can be used.

Mark out the position of panels and door openings on the floor plate, working towards the best position to conceal cut panel edges. Generally cut edges are placed at abutments with external walls, blinded at corners or behind door frames. It is desirable to avoid cut edges occurring at straight panel to panel joints in a run, as they will not readily line up with a finished edge.

Erection Of Panels

Measure the length of the wall to determine the need for any cut panels. Cut the first panel to fit at the wall position and fix with perforated angles fixed directly to the wall. Fixing through the angle into the structure is normally done with masonry nails, plugs or screws depending on the material.

Ensure the panel is plumb with the mark on the floor plate. Packing pieces between the panel and the floor plate may be required to adjust minor variations in height, they must be of a suitable material and adequate in size to give a solid bearing. Panels should have a 10mm clearance at the head position. The heel of the panel is secured by "skew" nailing with 100mm Bullet Head galvanised nails. Additionally "skew" nails can be driven through the face of the panel into the floor plate to provide extra fixing if required.



Panel Joints

The Durra Panel Biscuit connectors are used for vertical joints between panels. Spaced at 500mm centres Durra Wall Panel may be supplied with Biscuit connectors being factory installed to the leading edge of each panel.

The adjoining panel edge is supplied with grooved sections to locate the Biscuit connectors.

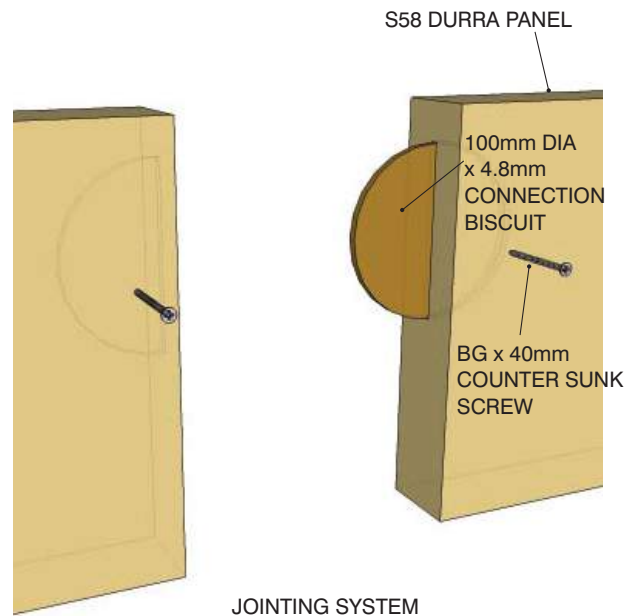
Adhesive

Adhesive is then applied to the installed panel's leading edge and to each Biscuit connector.

The next panel is positioned on the floor plate and slid into position, ensuring that each Biscuit enters the open grooves of the receiving panel.

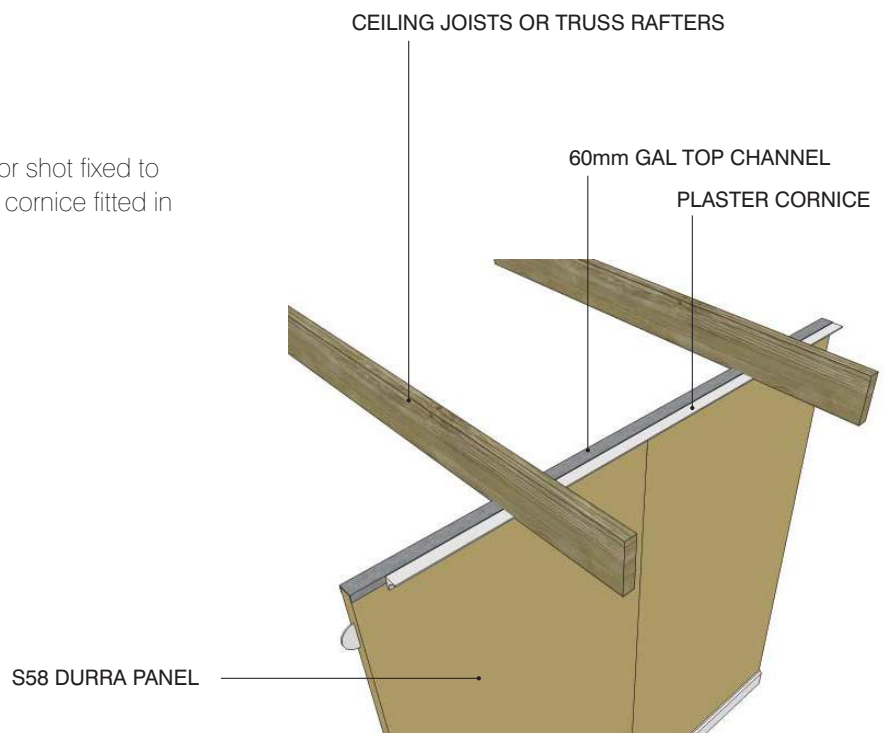
Check edge for plumb and pack as necessary to ensure a tight fit at the panel joint. Secure the joint with 5 No. 8 gauge x 40mm long countersunk screws – one screw for each Biscuit.

Each panel joint is fixed in the same way, until a wall run is completed.



Head Fixings

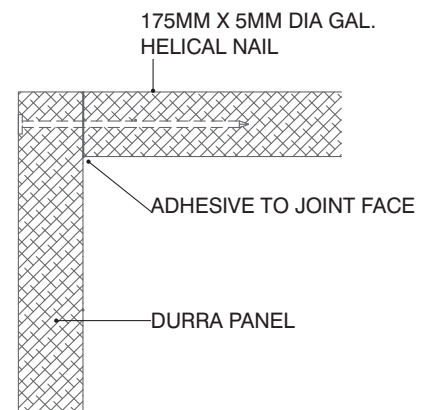
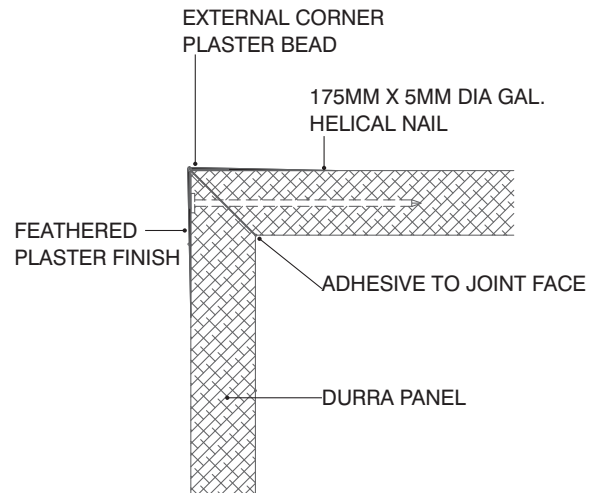
A metal head channel, screw nail or shot fixed to the structure with timber or plaster cornice fitted in the usual fashion.



Right Angle Junctions

Right angle junctions are formed with 45° mitre cuts. The exposed mitre cuts are covered with adhesive prior to connecting panels together. 175mm Helical nails are used to secure the joint.

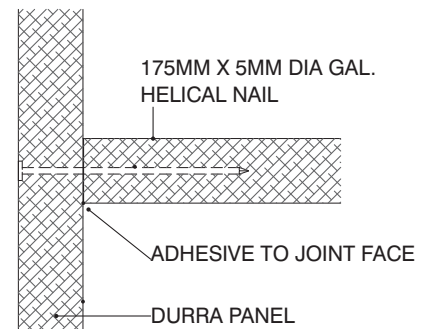
Plastering angle is nailed and glued to the external corner to complete the mechanical jointing process.



“T” Junctions

“T” junctions are formed with plastering angle being secured to each side of the Durra Wall Panel T58. Adhesive is applied to the full length of the panel to panel joint. 175mm Helical nails are inserted – 5 No. per panel to complete the mechanical jointing process.

Heads of the nails are hit so that they depress into the Durra Wall Panel T58 for later plaster concealment.

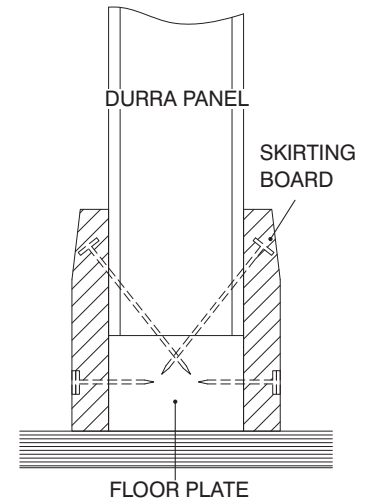


Secondary Fixings

Skirtings are primarily fixed onto the floor plate, the top edge of the skirting can be fixed with suitable length nails driven at a downward angle into the floor plate.

When driving nails into Durra Wall Panel T58 panels, improved holding will be achieved by driving nails in at opposing angles (dovetail nailing).

Architraves are generally fixed to the door frame but supplementary fixings into the partition can be made by the foregoing method if necessary.



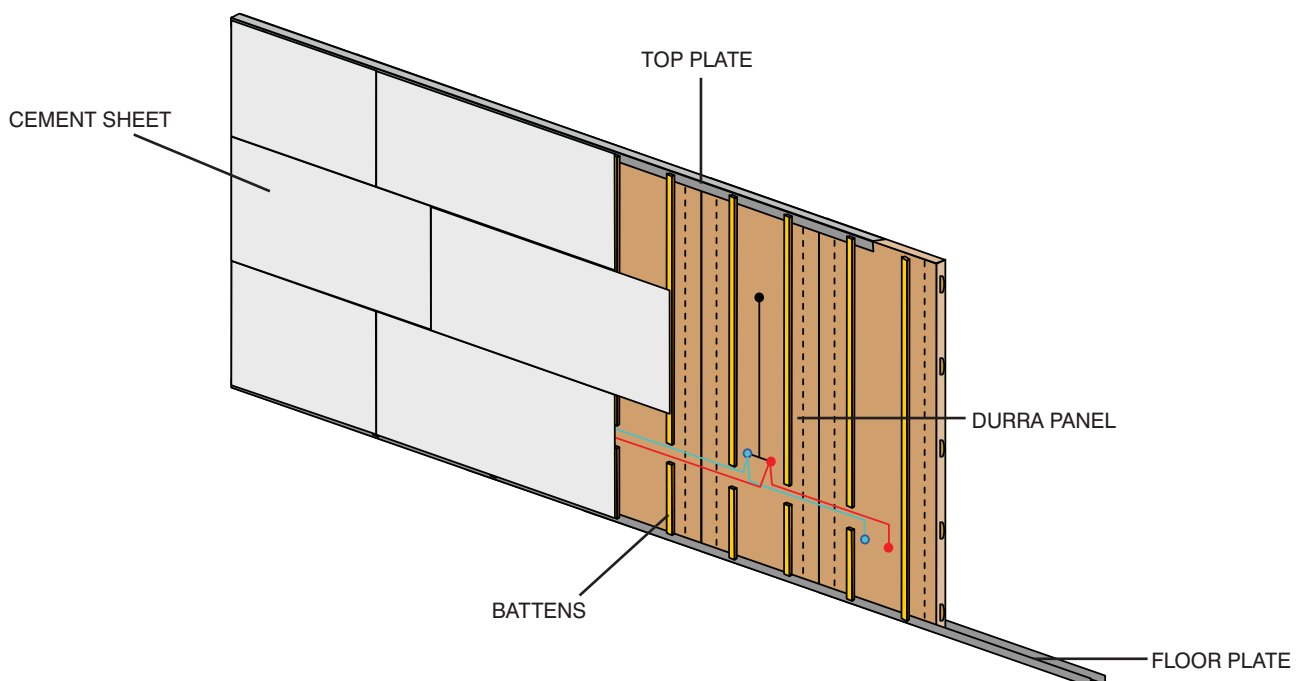
Wet Areas

We advise the use of cement sheet lining in these areas to protect the Durra Wall Panel from possible water damage.

In the case of a shower recess, Durra Wall Panels should be battened out and lined with cement sheet as per normal building practice. All plumbing is concealed in the lined cavity.

Care should be taken to silicone seal all cement sheet joints prior to finishing work.

Additional noggins can be installed as a fixing ground for cupboards, screens and hand rails.

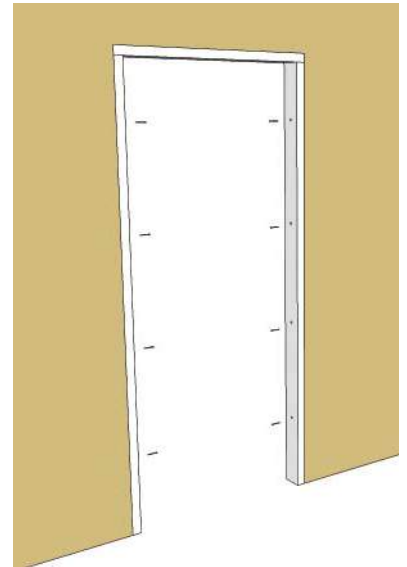


Penetrations: Doors & Windows

For large openings, such as those required for doors and windows, into which a frame or jamb is to be mounted; the following procedure should be followed. Door frames should preferably be inserted as work proceeds and “tacked” into position for adjustment and final fixing later.

1. Cut the opening required after setting out using a circular or reciprocating saw, finishing at the corners and floor level with a timber hand saw. **Refer to Section 1.3.3 for cutting details.**
2. Seal all cut edges of Durra Panel with 120mm Durra Aluminium tape.
3. The frame or jambs are screwed directly into the vertical edge of the Durra Wall Panel with 100mm x 14 gauge screws.
4. Four fixings to each jamb are normally sufficient. It is recommended that the door jambs are spot bonded with adhesive at the fixing positions, thereby allowing any structural or thermal movement to take place behind the architraves.

Note: Solid core doors require installation of (galvanised) Durra single channel over the aluminium tape to reinforce the panel edge prior to frame or jamb installation. Fix with both liquid nails and screws.



Fixings

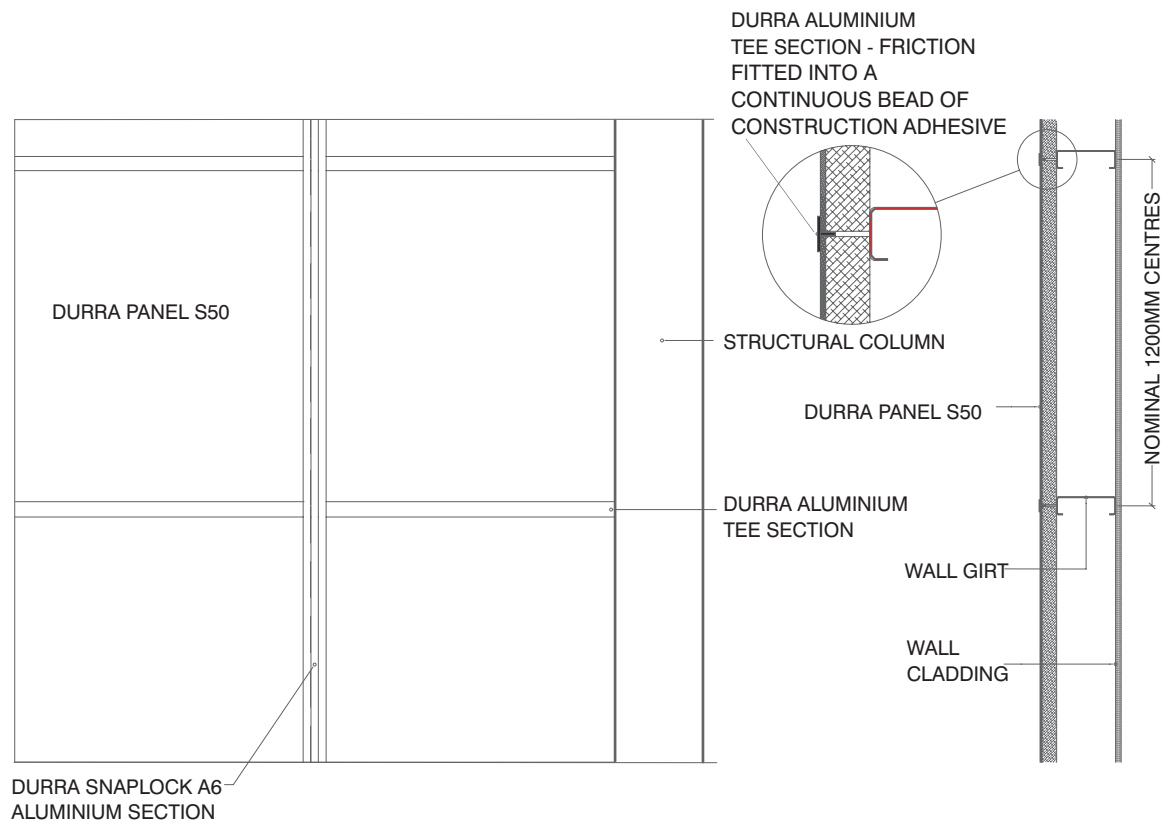
All normal household items may be fixed direct to the Durra Wall Panel T58 panel. Lightweight fixings, such as shelf brackets, mirrors and toilet roll holders, are fixed direct with normal wood screws, always ensuring that a screw giving maximum penetration and coarse thread is used.

Where exceptionally heavy fittings or items under sustained stress are to be fixed, such as kitchen wall cabinets and hand rails, special fixing devices may be necessary.

The Helicoil screw is one example. This is inserted into the panel with a mandrel, which is then withdrawn to provide a strong threaded steel insert, which will firmly hold the mating screw. (Available from Ortech Industries in cases of difficulty).

Durra Panel Wall Lining Face Fixed To Framework

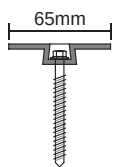
Typical Details



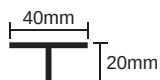
Elevation

Section

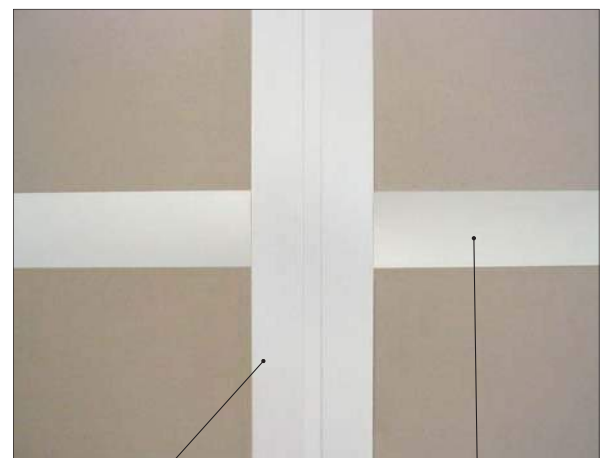
Wall Components



DURRA SNAPLOCK A6 ALUMINIUM SECTION PROFILE



DURRA ALUMINIUM TEE SECTION PROFILE -
FRICTION FITTED INTO A CONTINUOUS BEAD
OF CONSTRUCTION ADHESIVE



DURRA SNAPLOCK A6
ALUMINIUM SECTION

DURRA ALUMINIUM
TEE SECTION

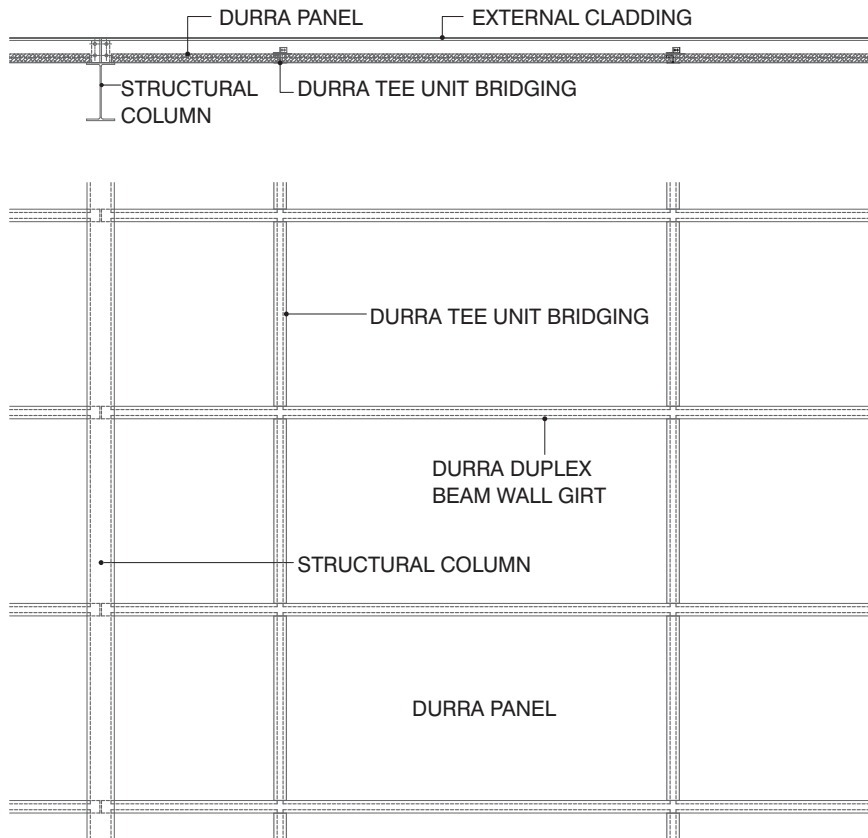
Stick Build Assembly

1. Durra Panel is stacked horizontally and fixed back to wall girts/trimming.
2. The bottom row of Durra Panels are required to sit on a timber bottom plate to elevate the panels from finished floor level.
3. The Durra Panel is connected along the long edge of each panel using the proprietary biscuit connectors.
4. The Durra Panel is fixed through the face of the panel around the perimeter of each panel.
5. Perimeter fixings are to be concealed using a combination of Durra Aluminium sections.
6. Vertical joints are to be concealed with Durra Snaplock A6 Aluminium Cover Strap.
7. Horizontal joints between panels are to be concealed with Durra Aluminium Friction Fit (using a continuous bead of construction adhesive) Tee Section
8. Durra Aluminium Angle is to be fixed to perimeter of each bay.
9. Durra Panel can be cut onsite for rake cutting and penetrations. All cut edges of Durra Panel must be sealed with Durra Aluminium Sealing tape.

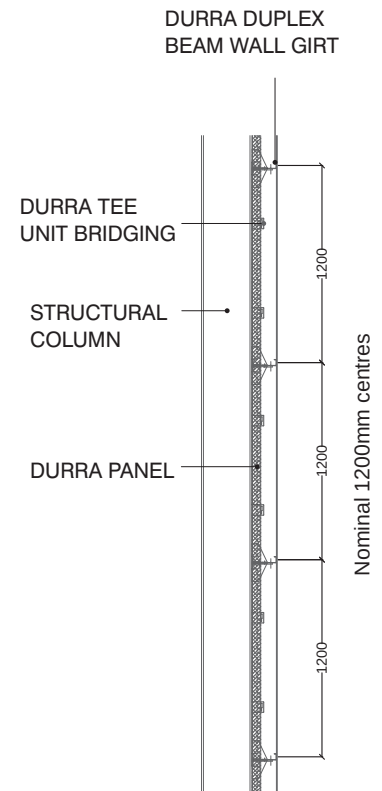


Durra Panels Installed In Durra Steel Section Wall Girts

Typical Details

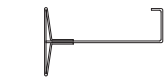


Elevation

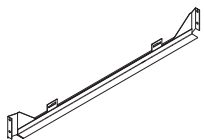


Section

Wall Components



DURRA DUPLEX BEAM WALL GIRT



DURRA TEE UNIT BRIDGING



DURRA DUPLEX BEAM WALL GIRT

DURRA TEE UNIT BRIDGING

Panelised Wall Assembly - Durra Lifting Frame

1. Durra Duplex or I-Beam wall girts are placed at 1200mm centres onto a ground based set out jig and Durra Cross Tee Units bolted into position.
2. Durra Panels are placed into the two way exposed grid assembly and locked down into position with Durra steel wedges.
3. Insulation and sarking is placed over the module.
4. Metal wall cladding is screwed down over the insulation.
5. Eaves gutter and down pipes can be installed into position.
6. The Durra Lifting Frame is craned onto the completed assembly and the hydraulic scissor connectors closed ready for hoisting.
7. The wall module is transitioned into a vertical plane during the crane hoisting process, it is then aligned with the column cleat and bolted home from an elevated work platform.
8. Vertical closure pieces are fitted to form a watertight module to module wall joint.



Section 7

Acoustic Test Data

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Cont'd

NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Section 7

Sound Absorption - NRC 0.85	7.4.3
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Sound Transmission Loss - STC 48	7.4.5
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www.ortech.com.au/downloads/cad-drawings-and-typical-details

Introduction

This section of our manual provides the user with quick and easy to understand visual reference source as a guide to the acoustic performance of our range of Durra Panels and Durra building systems. We have structured the introduction on the assumption that the reader has only a limited knowledge in the field of acoustics.

What Is Sound

Sound is produced by vibrating bodies - either string, air columns, or plates and membranes and travels through the air as a wave of energy. Generally, the pitch of a sound wave increases as its frequency increases.

Frequency

The frequency or pitch of sound may be high or low depending upon the rate of vibration. The unit of measure for this vibration is usually in Hertz (Hz). The human ear is sensitive enough to detect sound waves in the frequency range from 20 - 20,000 Hz.

dB - Decibel

The decibel is the unit used to measure sound. The volume of sound depends upon the magnitude of the vibration, which may be large or small (loud or soft) according to the amount of energy involved. Sound intensity is measured as a sound pressure level and is expressed in decibels.

dBA - Decibel A Weighted

The dBA is also a unit used to measure sound. Human hearing does not register all frequencies of sound equally. The dBA (A weighted) system of measurement makes allowance for the relative loudness of sounds as perceived by the human ear that is less sensitive to very low and very high frequencies of sound.

Acoustic Performance

When considering the acoustic performance of a building assembly or individual building product, we must consider both the absorption of sound and the transmission of sound. An effective sound absorbing material will not usually provide insulation against the transmission of sound and vice versa.

Sound Absorption (NRC)

The capacity of a material to absorb sound rather than reflect it is expressed as a Noise Reduction Coefficient. Material which has a sound absorption rate of 0.62 at 1000 Hz generally will absorb 62% of sound energy at the particular frequency, with the material surface reflecting 38% of sound energy back into the space. The averaging of these coefficients over the broad frequency spectrum (100-5000 Hz) is expressed as a single number Noise Reduction Coefficient (NRC). Values approaching 1.0 have the highest levels of sound absorption.

There are circumstances where absorption should be calculated at the varying frequencies but for most purposes the results based on the NRC average are sufficient.

An effective sound absorbing material will generally be porous in nature and have the ability to dissipate sound energy there by reducing acoustic reverberation / echo.

Sound Transmission Class (STC)

The capacity of a material or structure to reduce noise levels from one side to the other is expressed as a Sound Transmission Class.

Material which has a sound transmission coefficient of 30 at 1000 Hz will reduce the noise level by 30dB from one side of the material to the other.

The STC number is derived from the sound attenuation values tested at standard frequencies from 100 Hz to 5000 Hz. The averaging of these coefficients over the broad frequency spectrum (100-5000 Hz) is expressed as a Sound Transmission Class (STC) and is a useful way of comparing the performance of different types of materials and structures.

Factors affecting the acoustic insulation performance of a material or structure should be considered as follows:

- (i). Mass/Weight: The most important prerequisite when trying to insulate against the transmission of sound is the mass or weight of a material and its inherent structural integrity.
- (ii). Stiffness: Generally a material will vibrate more at certain frequencies than at others. At these particular frequencies the insulation effect of the material is lessened and so the sound energy is more easily transmitted.
- (iii). Uniformity: Sound travels through the air as an energy wave. It is therefore important to consider making an acoustic barrier as air tight as possible to avoid acoustic leaks through the structure.
- (iv). Discontinuity: Using an airspace to reduce the noise level from one side of a structure to the other. An increase in the volume of an air space will generally result in improved sound insulation.

Weighted Sound Reduction Index - R_w

The European rating system called the Weighted Sound Reduction Index; R_w , has been adopted for use in Australia and replaces the Sound Transmission Class; STC. The main difference between R_w and STC is the frequency range tested; R_w is measured over 100 - 3150 Hz while STC is measured over 125 - 4000Hz. The higher the R_w number, the greater the sound insulating properties of a building material or building system.

$R_w + C_{tr}$

C_{tr} is a negative adjustment correction factor that is applied to the R_w rating of a building material or building system to make allowance for the impact of low frequency noise when considering the sound insulating properties of that building material or building system. The C_{tr} adjustment factor is not a constant value and will vary for different materials and building systems. $R_w + C_{tr}$ will always be lower than R_w .

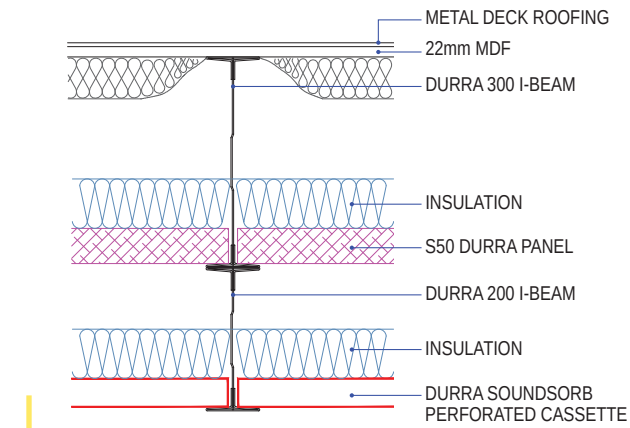
Conclusion

Our range of products, Roof Ceiling, Wall and Flooring Systems offer diverse high performance cost effective solutions to a wide range of complex acoustic problems, in areas such as: Airports, Stadiums and Arenas, Theatres, Studios, Printing Works, Entertainment and Convention Centres, Gymnasiums, Schools, Churches, Industry and at home.

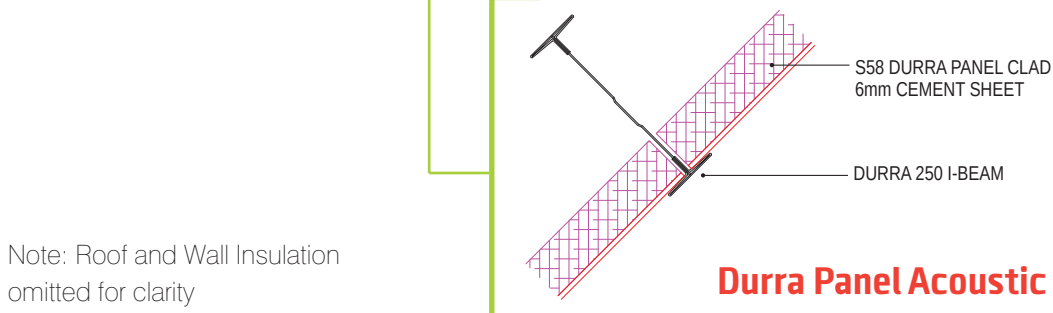
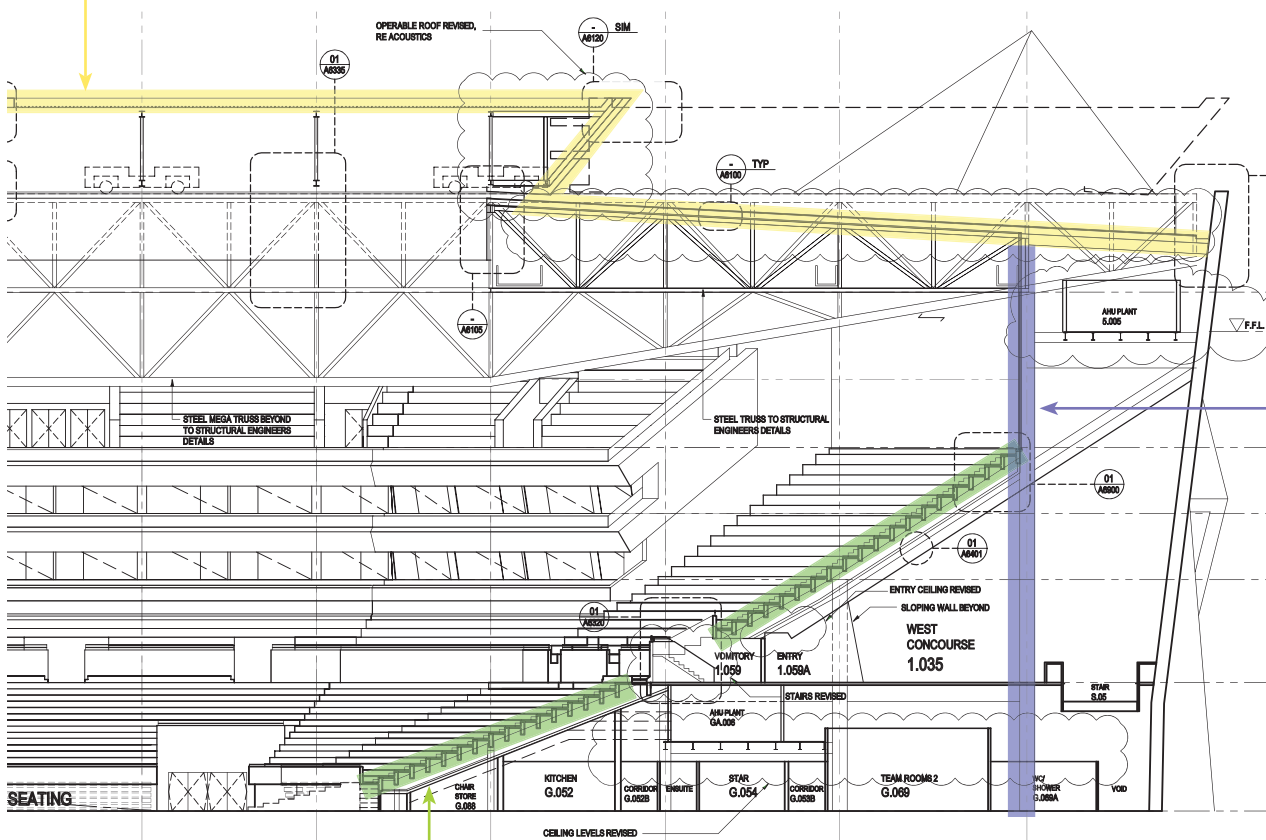
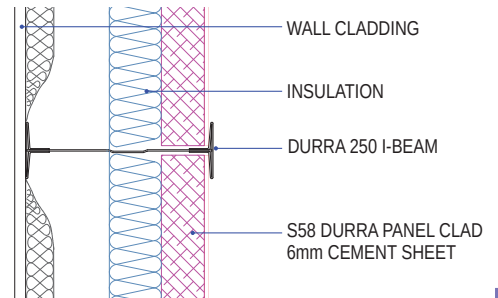
Our skilled technical staff are at your service should you require further information. Ortech Industries recommend the engagement of specialist acoustic consultants with regard to your specific project requirements.

Durra Panel and Durra Steel Sections Acoustic Envelope - Perth Arena

Durra Panel Acoustic Roof/Ceiling System



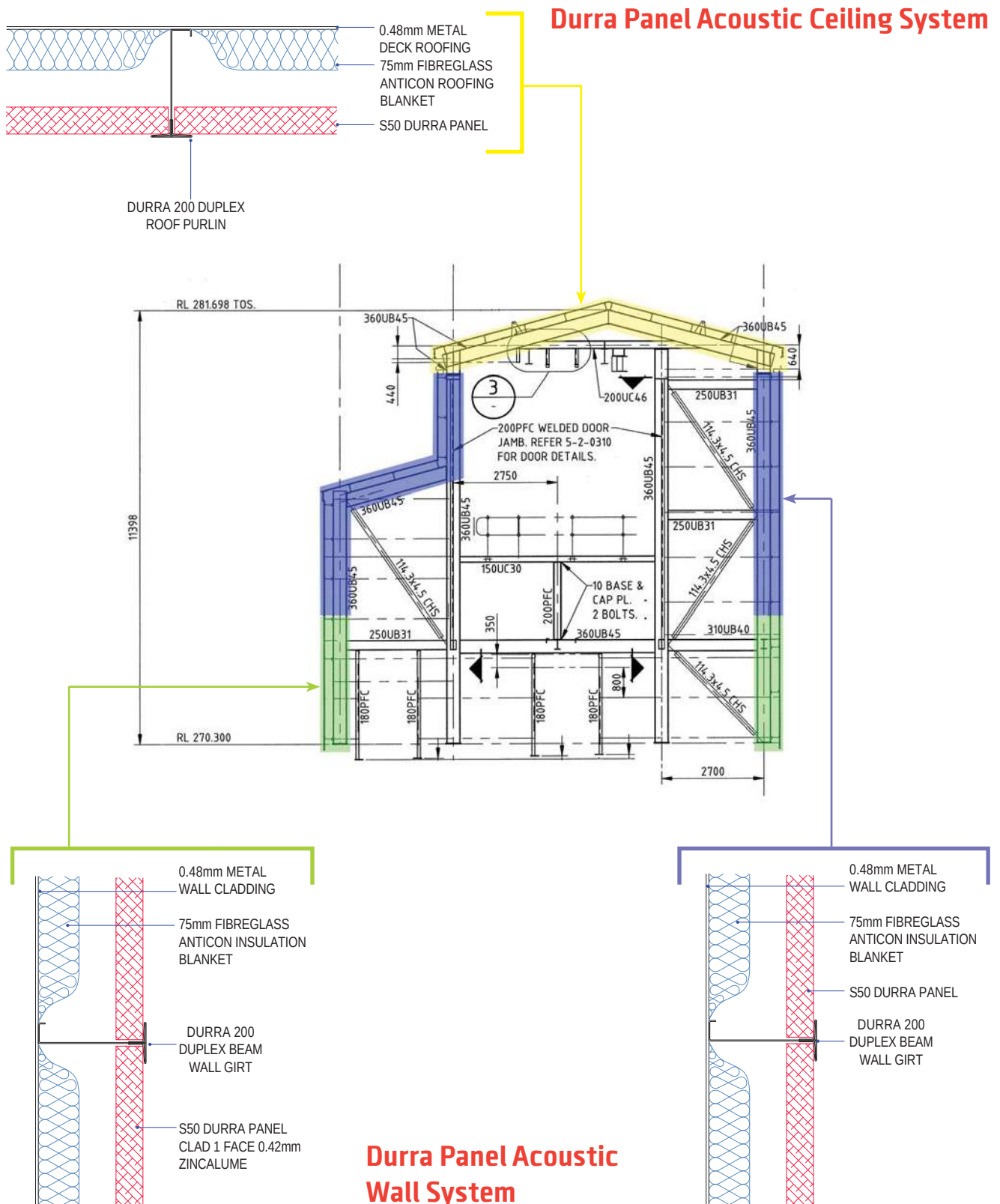
Durra Panel Acoustic Wall System



Note: Roof and Wall Insulation omitted for clarity

Durra Panel Acoustic Plenum System

Durra Panel and Durra Steel Sections Acoustic Envelope - Coal Rotary Breaker Station



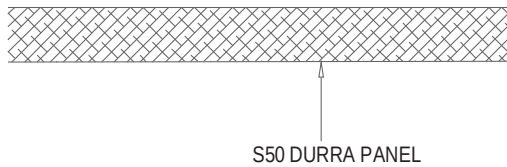
Sound Absorption - NRC 0.13

S50 Durra Panel: Plain

Product Details

REFERENCE: **SA - 01**

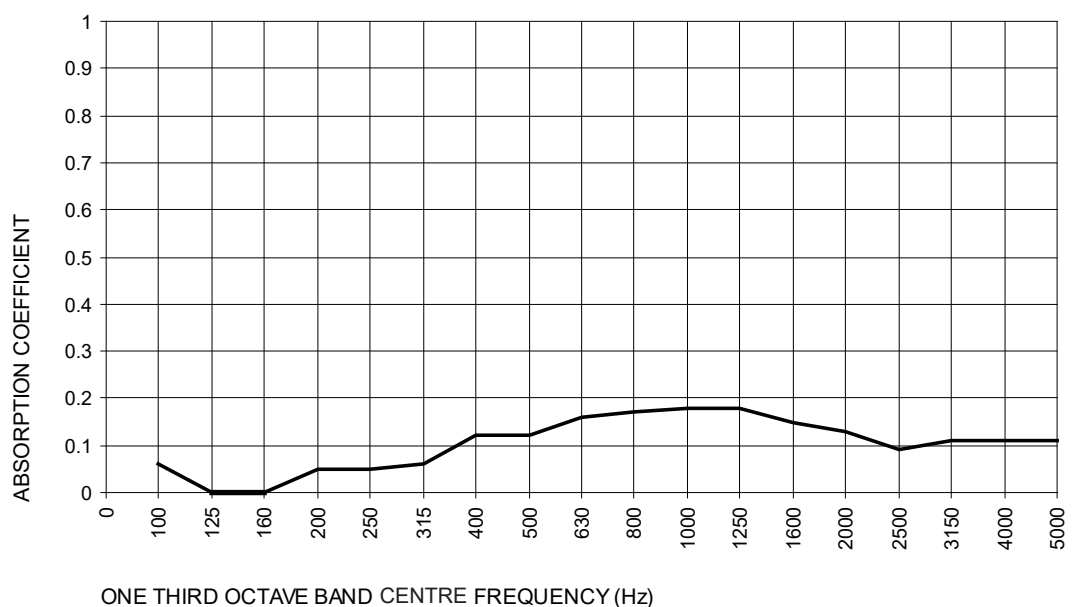
TESTED: Durra Panel S50mm – Plain finish.
Reverberation room test with
samples laid direct onto floor.



REPORT: NATA 415-82
AS 1045-1971
Louis A. Challis & Associates

Performance Data

FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
ABSORPTION COEFFICIENT	.06	.00	.00	.05	.05	.06	.12	.16	.16	.17	.18	.18	.15	.13	.09	.11	.11	.11



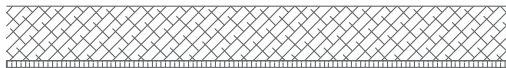
Sound Absorption - NRC 0.49

S50 Durra Panel Acoustic Pattern: Luxoltex Fine Finish

Product Details

REFERENCE: **SA - 02**

TESTED: Durra Panel S50mm – Hardboard clad with acoustic pattern – Luxoltex finish. Overlaid with 50mm fiberglass and 125mm airspace.

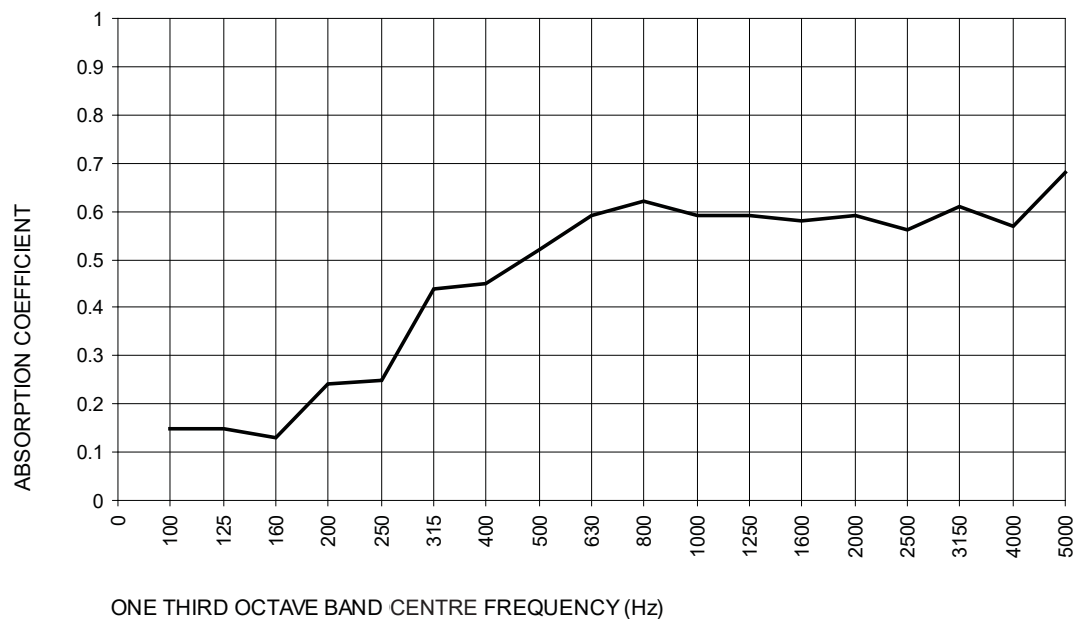


S50 DURRA PANEL
ACOUSTIC PATTERN

REPORT: NATA 415-82
AS 1045-1971
Louis A. Challis & Associates

Performance Data

FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
ABSORPTION COEFFICIENT	.15	.15	.13	.24	.25	.44	.45	.52	.59	.62	.59	.59	.58	.59	.56	.61	.57	.68



Sound Absorption - NRC 0.70

S50 Durra Panel Soundsorb: Plain 25/35

Product Details



S50 DURRA PANEL SOUNDSORB
POLYESTER 25mm x 35kg/m³

REFERENCE: **SA - 07**

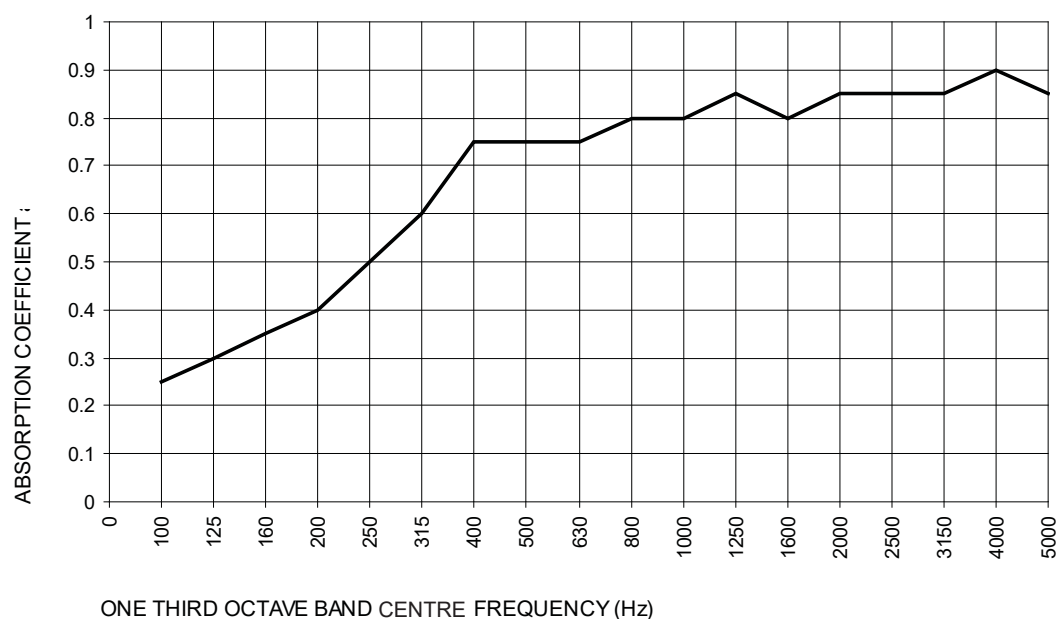
TESTED: Durra Panel S50mm faced with
25mm x 35Kg/m³ Polyester
insulation.

Polyester available in Black, White
& Grey.

REPORT: 121/552KC
AS 1045-1988
RMIT - NATA

Performance Data

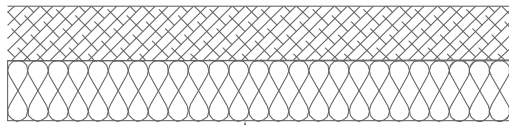
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
ABSORPTION COEFFICIENT	.25	.30	.35	.40	.50	.60	.75	.75	.75	.80	.80	.85	.80	.85	.85	.85	.90	.85



Sound Absorption - NRC 0.90

S50 Durra Panel Soundsorb: Plain 50/35

Product Details



S50 DURRA PANEL SOUNDSORB
CASSETTE: POLYESTER 50mm x 35kg/m³

REFERENCE: **SA - 08**

TESTED: Durra Panel S50mm faced with
50mm x 35Kg/m³ Polyester
insulation.

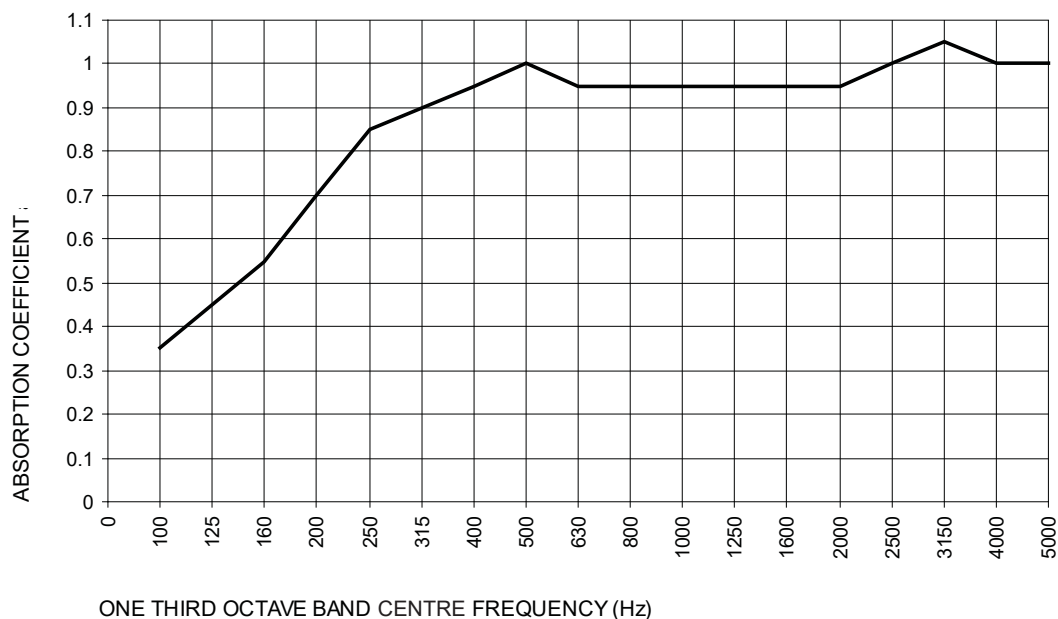
Polyester available in Black, White
& Grey.

- Mechanical fixing required for plain finish.

REPORT: 121I/507KC
AS 1045-1988
RMIT - NATA

Performance Data

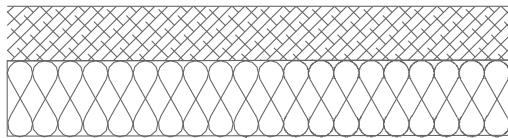
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
ABSORPTION COEFFICIENT	.35	.45	.55	.70	.85	.90	.95	1.0	.95	.95	.95	.95	.95	.95	1.0	1.05	1.0	1.0



Sound Absorption - NRC 1.05

S50 Durra Panel Soundsorb: Plain 75/48

Product Details



S50 DURRA PANEL SOUNDSORB
CASSETTE: POLYESTER 75mm x 48kg/m³

REFERENCE: **SA - 09**

TESTED: Durra Panel S50mm faced with
75mm x 48Kg/m³ Polyester
insulation.

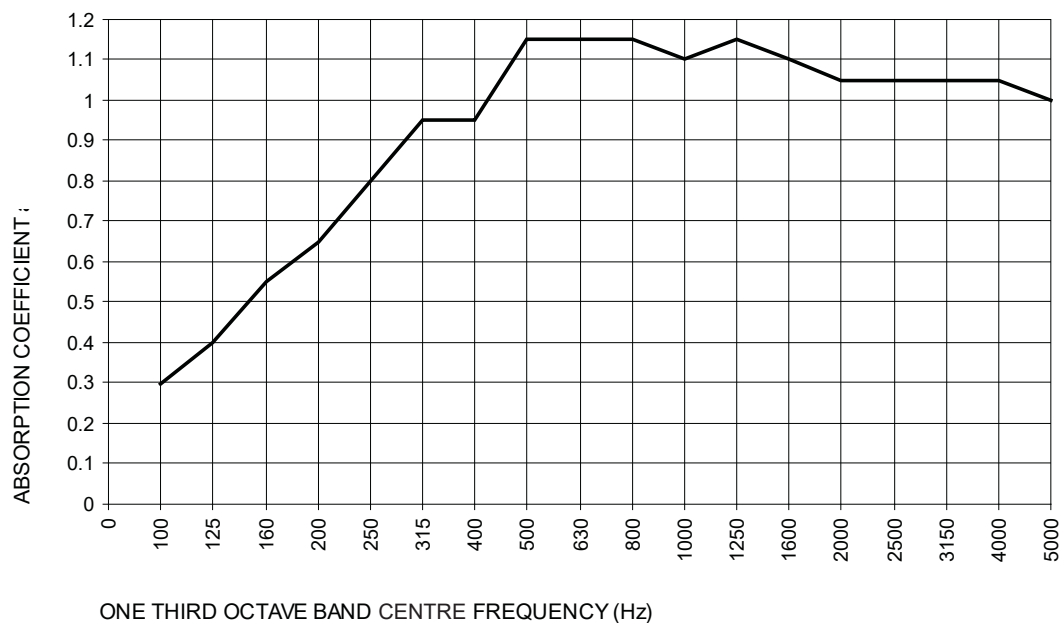
Polyester available in Black, White
& Grey.

- Mechanical fixing required for plain finish.

REPORT: 121/719KC
AS 1045-1988
RMIT - NATA

Performance Data

FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
ABSORPTION COEFFICIENT	.30	.40	.55	.65	.80	.95	.95	1.15	1.15	1.15	1.10	1.15	1.10	1.05	1.05	1.05	1.05	1.0



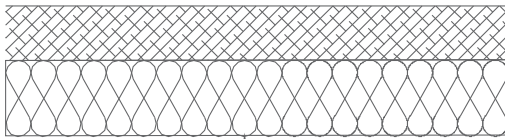
Sound Absorption - NRC 1.05

S50 Durra Panel Soundsorb: Fabric Faced 75/48

Product Details

REFERENCE: **SA-10**

TESTED: Durra Panel S50mm faced with 75mm x 48Kg/m³ black fabric faced fiberglass.

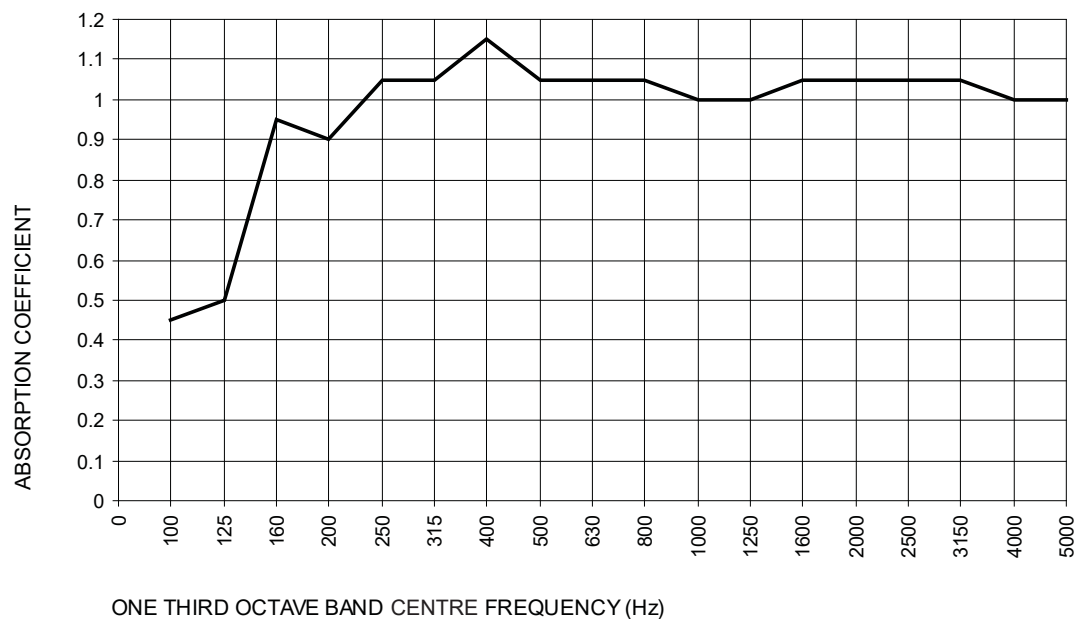


S50 DURRA PANEL SOUNDSORB
CASSETTE: FIBREGLASS 75mm x 48kg/m³

REPORT: 1211/03-014/PD
AS 1045-1988
RMIT - NATA

Performance Data

FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
ABSORPTION COEFFICIENT	.45	.50	.95	.90	1.05	1.05	1.15	1.05	1.05	1.05	1.0	1.0	1.05	1.05	1.05	1.05	1.0	1.0



Sound Transmission Loss - STC 31

S50 Durra Panel: Plain

Product Details

REFERENCE: **ST - 01**

TESTED: Durra Panel S50mm – Plain finish.

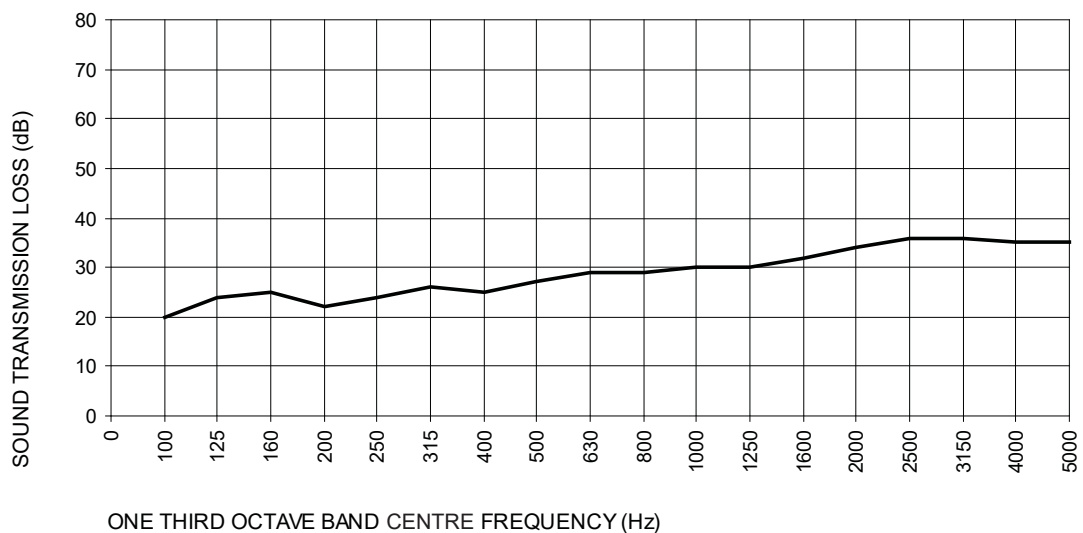


S50 DURRA PANEL

REPORT: 3798-1-82
AS 1276-1979
Louis A. Challis & Associates

Performance Data

FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	20	24	25	22	24	26	25	27	29	29	30	30	32	34	36	36	35	35



Sound Transmission Loss - STC 34

S58 Durra Panel: Plain

Product Details

REFERENCE: **ST - 04**

TESTED: Durra Panel S58 – Plain finish.

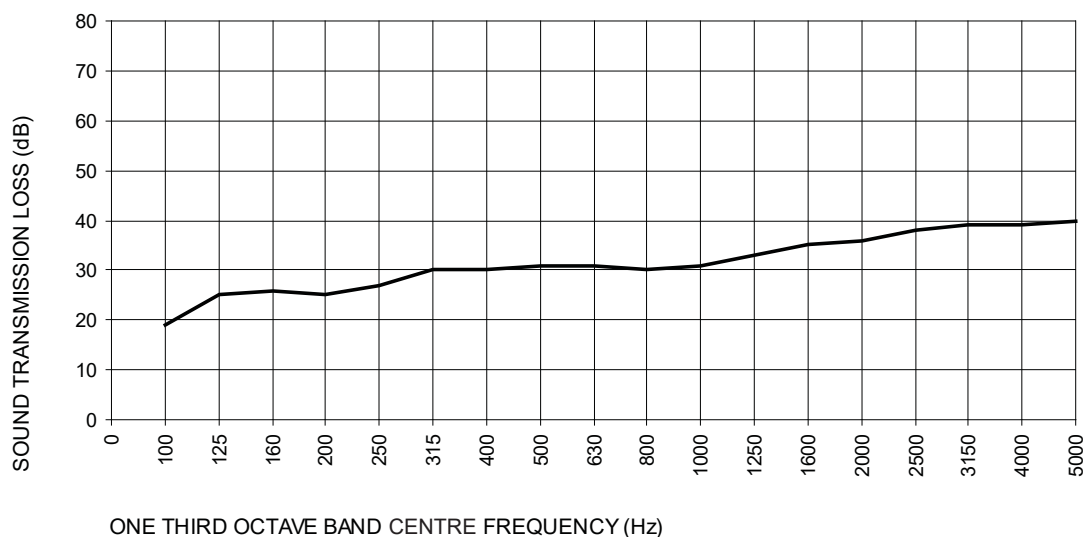


T58 DURRA PANEL

REPORT: NVLAP AS-TL1916
ASTM E 90-99
ASTM E 413-87
ASTM E 1332-90
Acoustic Systems Acoustical
Research Facility

Performance Data

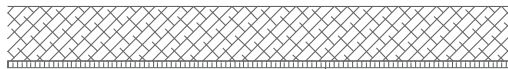
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	19	25	26	25	27	30	30	31	31	30	31	33	35	36	38	39	39	40



Sound Transmission Loss - STC 34

S50 Durra Panel Acoustic Pattern: Plain

Product Details



S50 DURRA PANEL
ACOUSTIC PATTERN

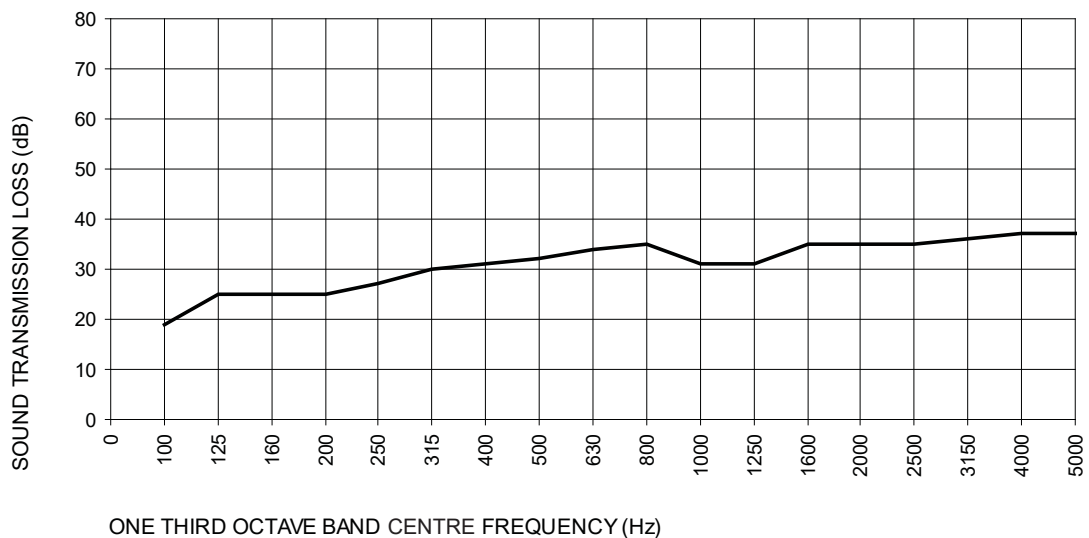
REFERENCE: **ST - 05**

TESTED: Durra Panel S50mm –
Acoustic pattern.

REPORT: NVLAP AS-TL1863
ASTM E 90-99
ASTM E 413-87
ASTM E 1332-90
Acoustic Systems Acoustical
Research Facility

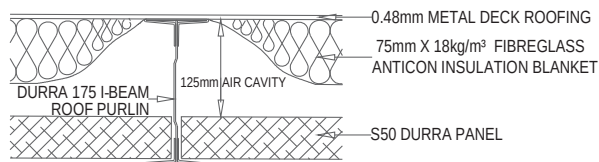
Performance Data

FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	19	25	25	25	27	30	31	32	34	35	34	34	35	35	35	36	37	37



Roof And Ceiling Systems

Quick Reference Guide: Sound Transmission Loss - Insul Predictions + / - 3 STC



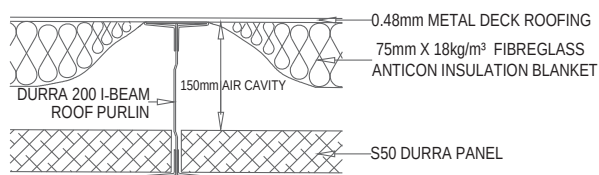
Durra 175 I-Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	17	23	39	49	57	62	72

Reference ST - 35.1

STC

47



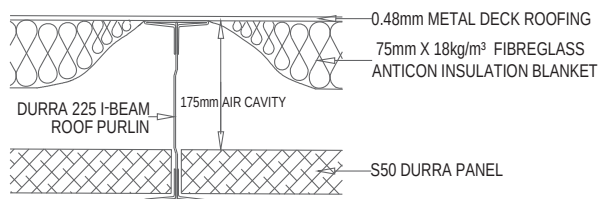
Durra 200 I-Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	16	25	40	50	57	62	72

Reference ST - 35.2

STC

49



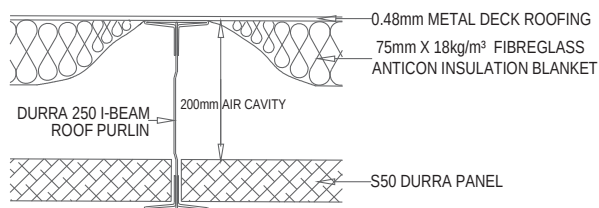
Durra 225 I-Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	16	28	42	50	57	62	72

Reference ST - 35.3

STC

51



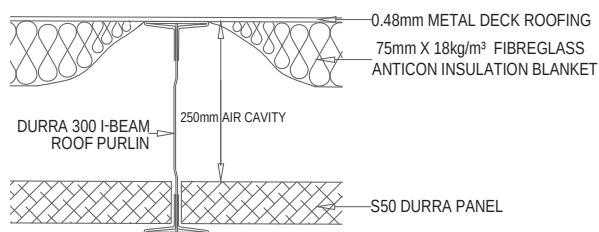
Durra 250 I-Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	16	28	43	50	57	62	72

Reference ST - 35.4

STC

52



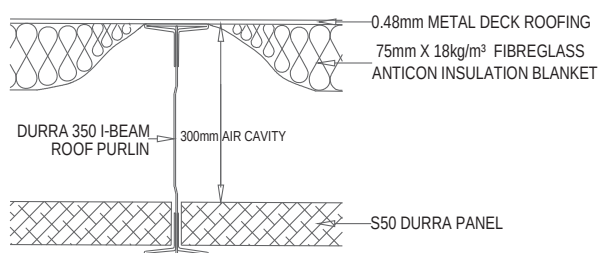
Durra 300 I-Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	16	30	40	50	57	62	72

Reference ST - 35.5

STC

52



Durra 350 I-Beam Roof Purlin

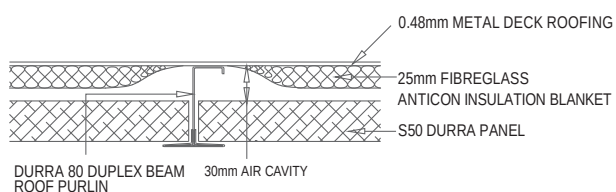
FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	17	31	41	50	57	62	72

Reference ST - 35.6

STC

52

Quick Reference Guide: Sound Transmission Loss - Insul Predictions + / - 3 STC



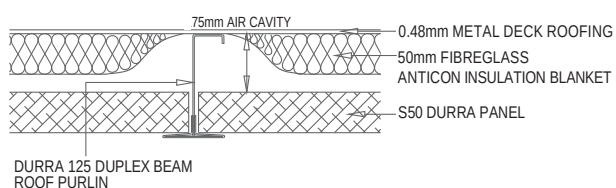
Durra 80 Duplex Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	19	21	25	41	54	60	71

Reference ST - 36.1

STC

38



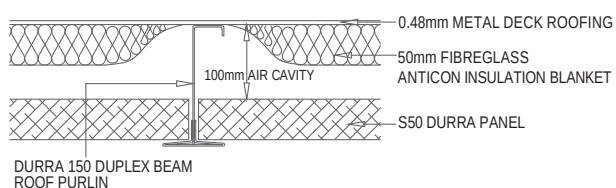
Durra 125 Duplex Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	18	18	35	50	57	62	72

Reference ST - 36.2

STC

42



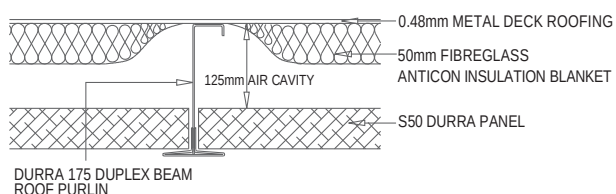
Durra 150 Duplex Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	20	24	39	53	57	62	72

Reference ST - 36.3

STC

48



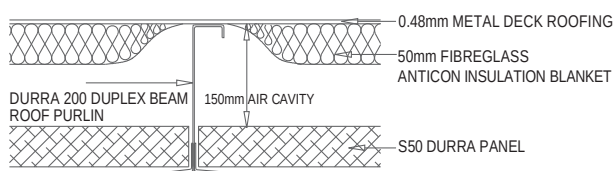
Durra 175 Duplex Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	17	23	39	49	57	62	72

Reference ST - 36.4

STC

47



Durra 200 Duplex Beam Roof Purlin

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	16	25	40	50	57	62	72

Reference ST - 36.5

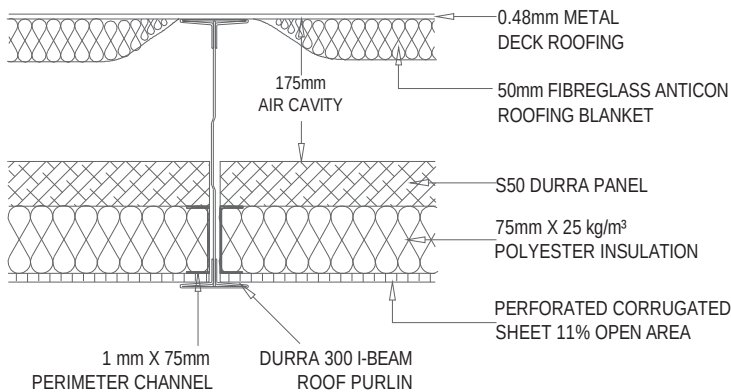
STC

49

Sound Absorption - NRC 0.85

Durra Roof & Ceiling System: S50 Durra Panel Soundsorb: Perforated Corrugated 75/25

Product Details



REFERENCE: **SA - 05**

TESTED:

Durra Panel: S50 Soundsorb: Perforated Corrugated Cassette: Polyester 75mm x 25kg/m³

Roof Purlin: Durra 300 I-Beam

Air Cavity: 175mm

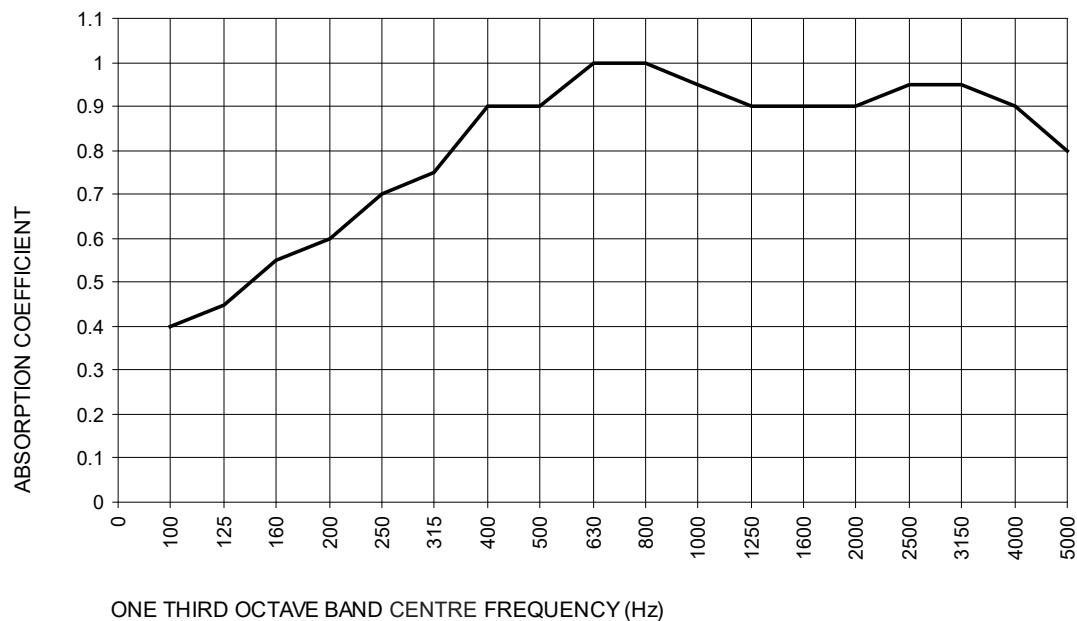
Insulation: 50mm Fibreglass Anticon Roofing Blanket

Cladding: 0.48mm Metal Deck Roofing

REPORT: 1211/832/PD
AS 1045-1988
RMIT

Performance Data

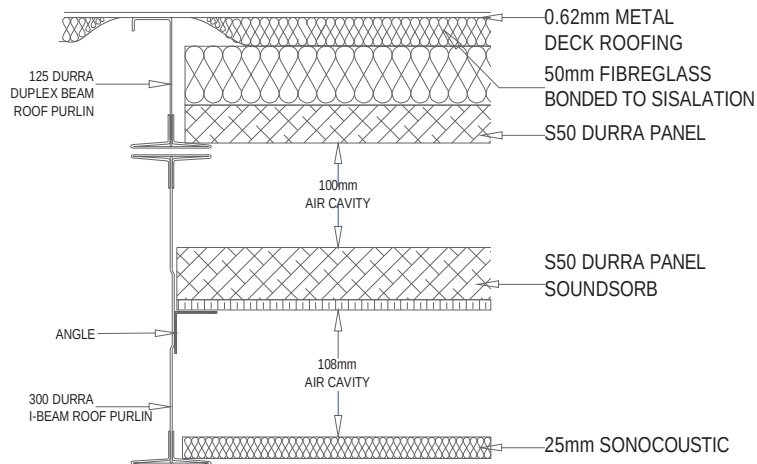
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
ABSORPTION COEFFICIENT	.40	.45	.55	.60	.70	.75	.90	.90	1.0	1.0	.95	.90	.90	.90	.95	.95	.90	.80



Sound Absorption - NRC 1.02

Durra Roof & Ceiling System: Double Layer - S50 Soundsorb: Plain & S50 Plain

Product Details



REFERENCE: SA - 06

TESTED:

Durra Panel: S50 Soundsorb: Plain
(Double layer) S50 Plain

Roof Purlin: Durra 300 I-Beam
(Double purlin) Durra 125 Duplex Beam

Air Cavity: 108mm
(Double cavity) 100mm

Insulation: 75mm Fibreglass Blanket

Cladding: 0.62 Metal Deck Roofing
552-83

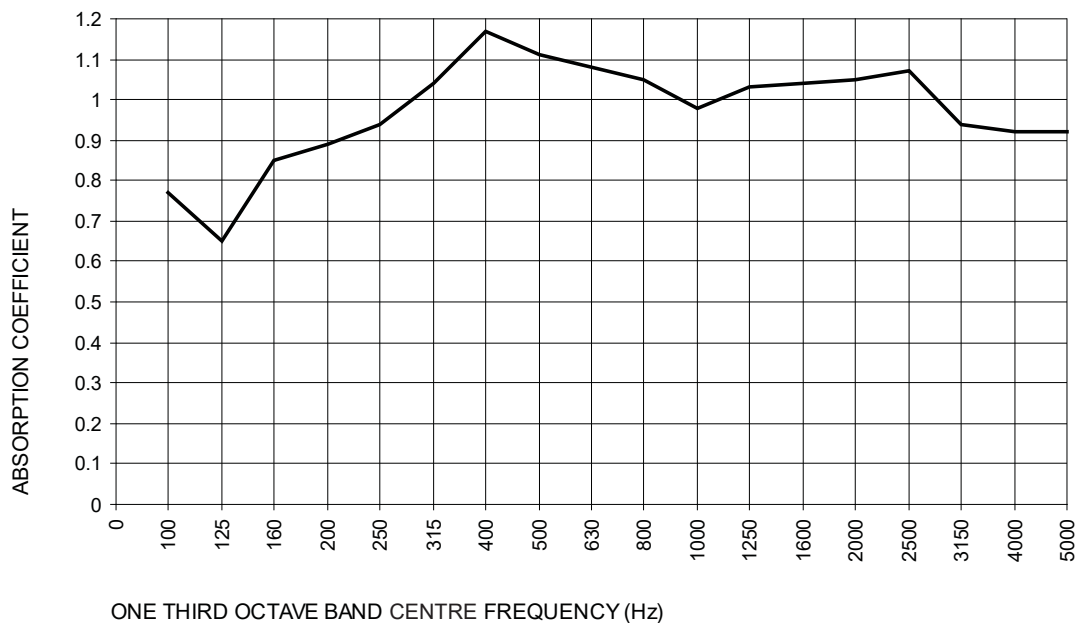
REPORT:

AS 1045-1971

Louis A. Challis & Associates

Performance Data

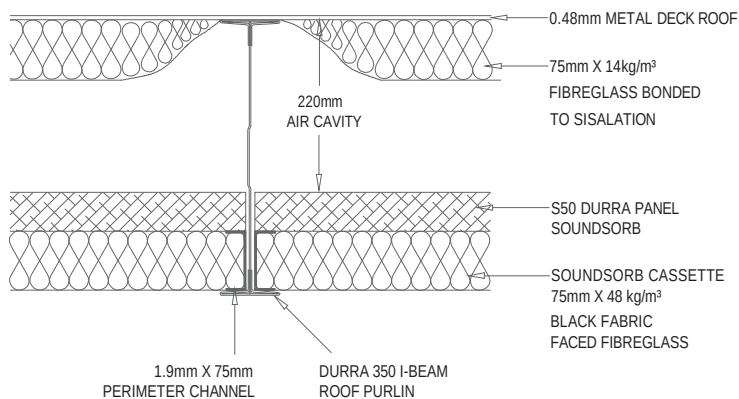
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
ABSORPTION COEFFICIENT	.77	.65	.85	.89	.94	1.04	1.17	1.11	1.08	1.05	.98	1.03	1.04	1.05	1.07	.94	.92	.92



Sound Transmission Loss - Rw 52

Durra Roof & Ceiling System: S50 Durra Panel Soundsorb: Fabric Faced 75/48

Product Details



REFERENCE: **ST - 06**

TESTED:

Durra Panel: S50 Soundsorb: Black fabric faced. Cassette: Fibreglass 75mm x 48kg/m³

Roof Purlin: Durra 350 I-Beam

Air Cavity: 220mm

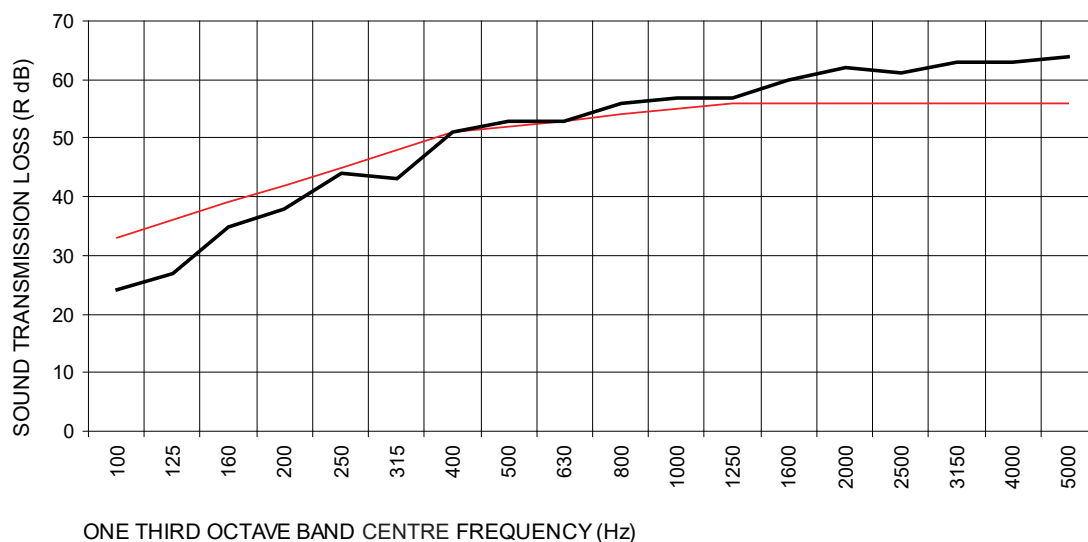
Insulation: 75mm Fibreglass Anticon Roofing Blanket

Cladding: 0.48mm Metal Deck Roofing

REPORT: NATA 121/03-035/PD
AS 1191-1985
RMIT

Performance Data

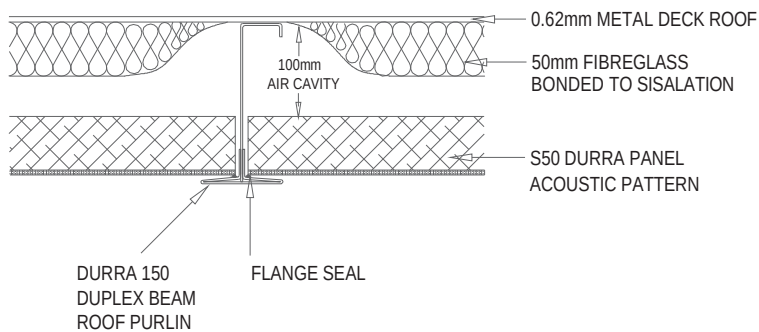
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	24	27	35	38	44	43	51	53	53	56	57	57	60	62	61	63	63	64
Rw REFERENCE CURVE	33	36	39	42	45	48	51	52	53	54	55	56	56	56	56	56	56	56



Sound Transmission Loss - STC 42

Durra Roof & Ceiling System: S50 Durra Panel Acoustic Pattern: Plain

Product Details



REFERENCE: **ST - 07**

TESTED:

Durra Panel: S50 Acoustic Pattern: Plain

Roof Purlin: Durra 150 Duplex Beam

Air Cavity: 100mm

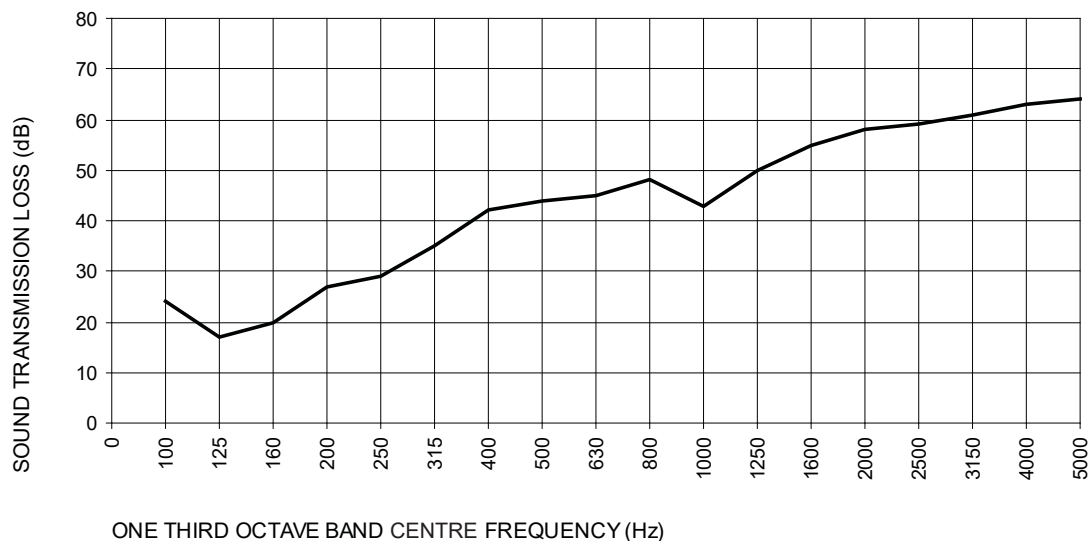
Insulation: 50mm Fibreglass Anticon Roofing Blanket

Cladding: 0.62mm Metal Deck Roofing

REPORT: NATA 1211/03-035/PD
AS 1191-1985
RMIT

Performance Data

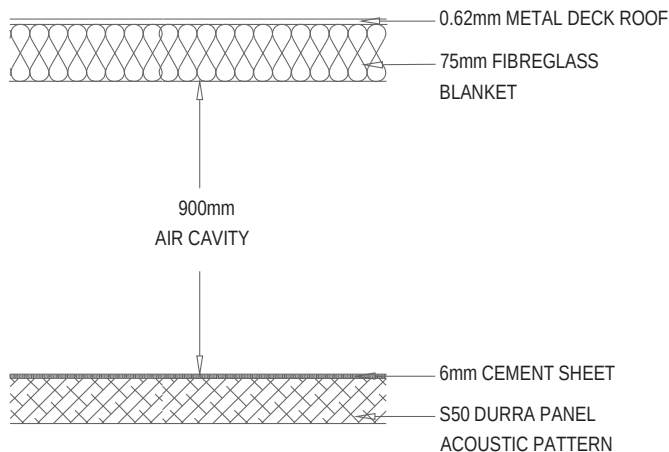
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	24	17	20	27	29	35	42	44	45	48	43	50	55	58	59	61	63	64



Sound Transmission Loss - STC 58

Durra Suspended Ceiling: S50 Durra Panel Clad 6mm Cement Sheet

Product Details



REFERENCE: **ST - 08**

TESTED:

Durra Panel: S50 Acoustic Pattern clad with 6mm cement sheet

Roof Purlin: Duplex Beam (non specified)

Air Cavity: 900mm

Insulation: 75mm Fibreglass Anticon Roofing Blanket

Cladding: 0.62mm Metal Deck Roofing

REPORT:

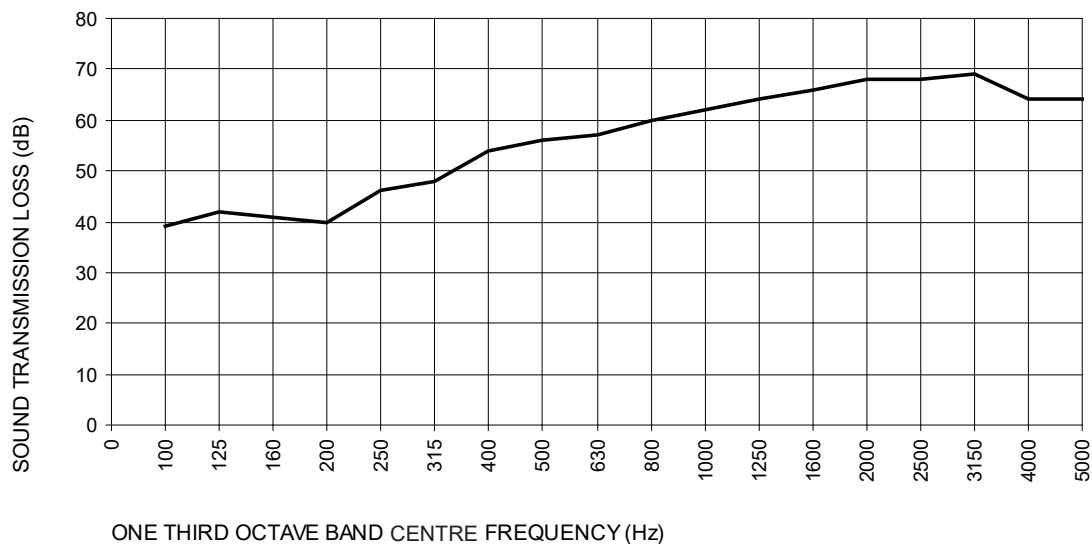
EBS SI 1345

AS 1276-1979

Experimental Building Station
North Ryde

Performance Data

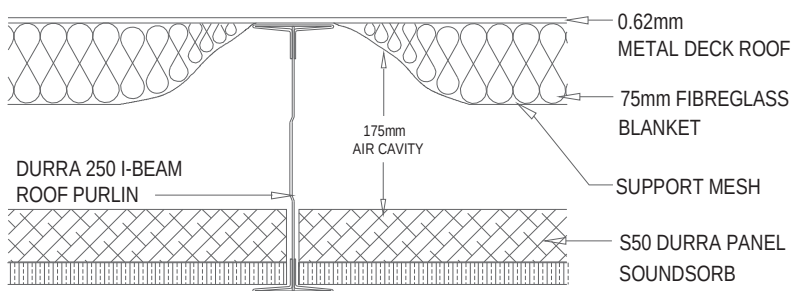
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	39	42	41	40	46	48	54	56	57	60	62	64	66	68	68	69	64	64



Sound Transmission Loss - Rw 48

Durra Roof & Ceiling System: S50 Durra Panel Soundsorb: Fabric Faced

Product Details



REFERENCE: **ST - 09**

TESTED:

Durra Panel: S50 Soundsorb black fabric faced

Durra 250 I-Beam

Roof Purlin:

175mm

Air Cavity:

Insulation: 75mm Fibreglass Anticon Roofing Blanket

Cladding: 0.62mm Metal Deck Roofing

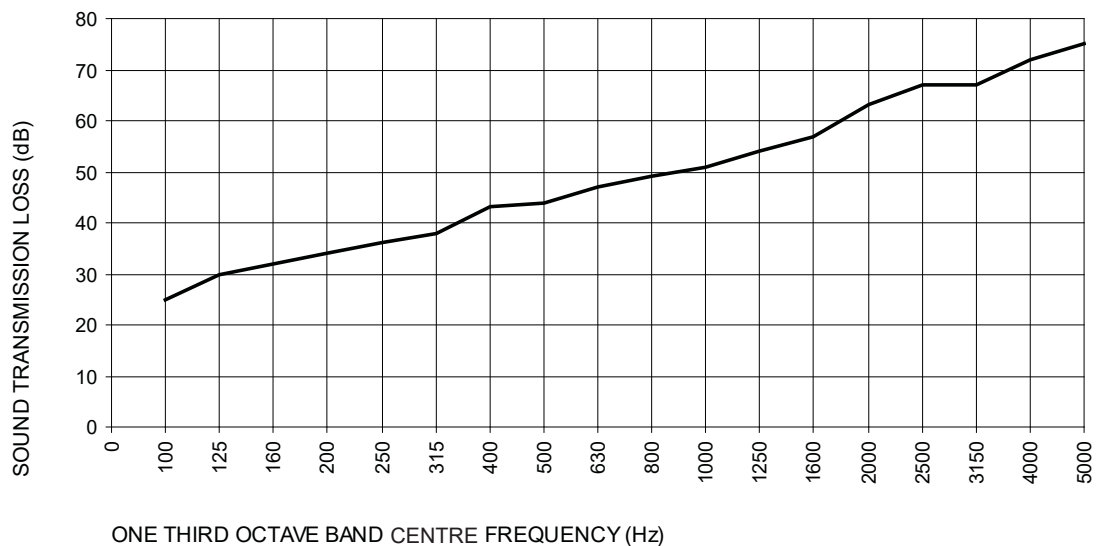
REPORT: 354BA/162/4517-1

AS1276-1979

Louis A. Challis & Associates

Performance Data

FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	25	30	32	34	36	38	43	44	47	49	51	54	57	63	67	67	72	75



Sound Transmission Loss - STC 49

Durra Roof & Ceiling System: S50 Durra Panel Soundsorb: Fabric Faced

Product Details

REFERENCE: **ST - 10**

TESTED:

Durra Panel: S50 Soundsorb black fabric faced

Roof Purlin: Durra 250 I-Beam

Air Cavity: 175mm

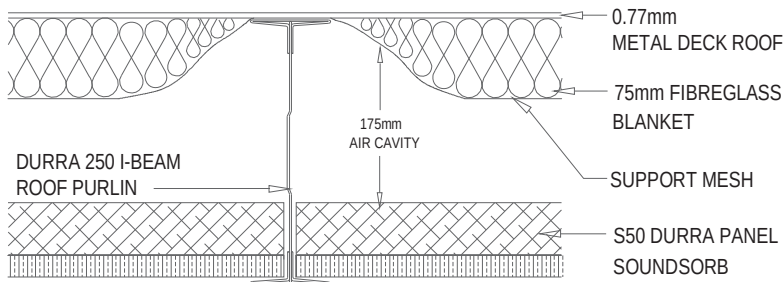
Insulation: 75mm Fibreglass Anticon Roofing Blanket

Cladding: 0.77mm Metal Deck Roofing

REPORT: 3667/159/4517 B-4-83

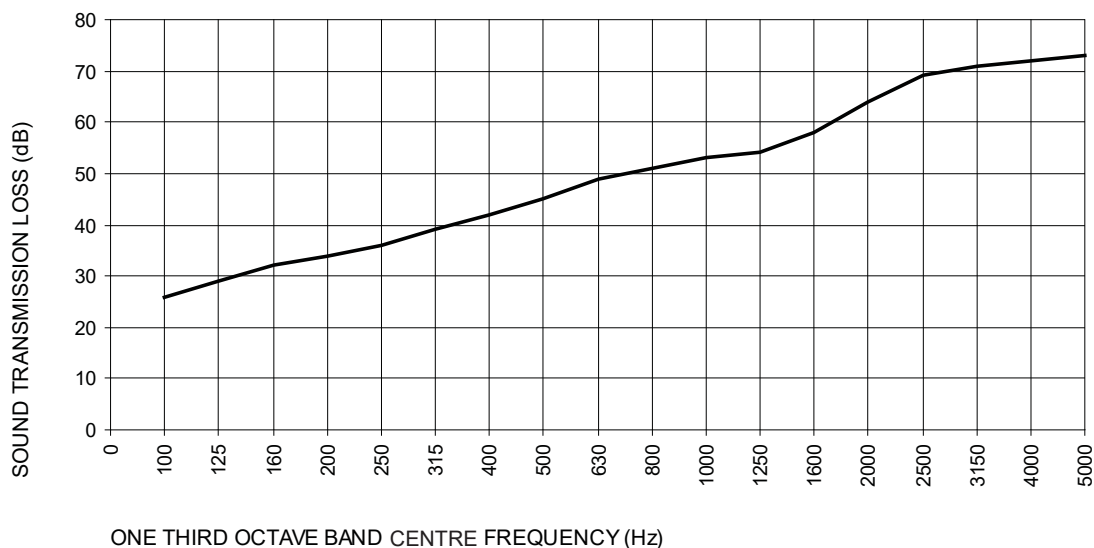
AS 1276-1979

Louis A. Challis & Associates



Performance Data

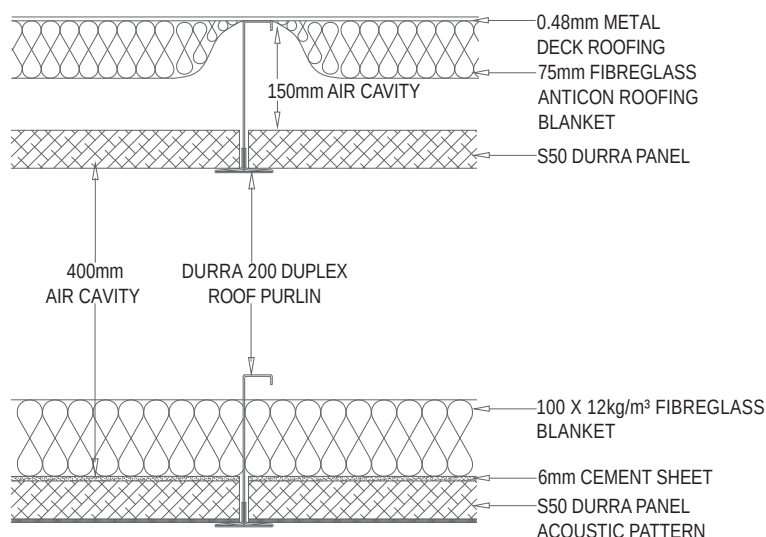
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	26	29	32	34	36	39	42	45	49	51	53	54	58	64	69	71	72	73



Sound Transmission Loss - RW 74

Durra Roof & Ceiling System: Double Layer - S50 Durra Panel Acoustic Pattern Clad 6mm Cement Sheet & S50 Plain

Product Details



REFERENCE: **ST - 35**

TESTED:

Durra Panel: S50 Acoustic Pattern Clad 1 Face
(Double layer) 6mm Cement Sheet
S50 Plain

Roof Purlin: Durra 200 Duplex Beam
(Double Purlin) Durra 200 Duplex Beam

Air Cavity: 400mm
(Double Cavity) 150mm

Insulation: 100mm Fibreglass Blanket
(Double Insulation) 75mm Fibreglass Anticon Roofing Blanket

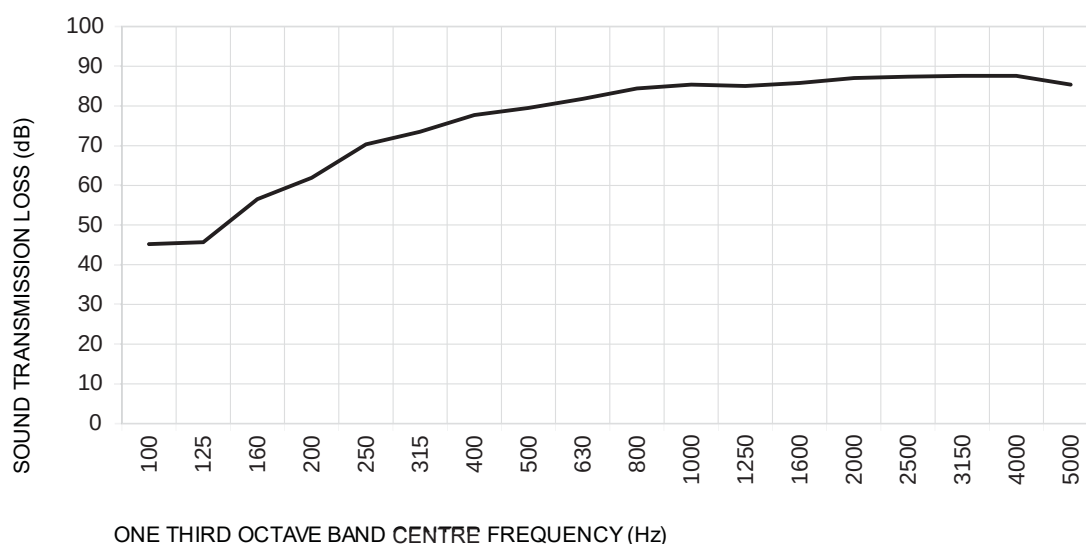
Cladding: 0.48 Metal Deck Roofing

REPORT: NATA 1211/11-190/PD
AS 1191 -1985
RMIT

Performance Data

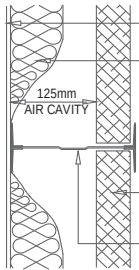
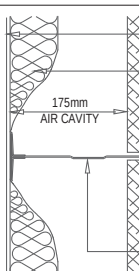
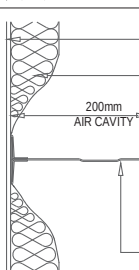
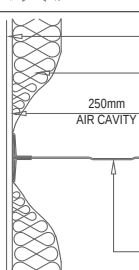
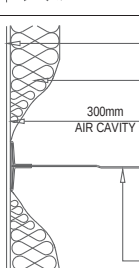
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K
TRANSMISSION LOSS (dB)	45	46	57	62	70	74	78	80	82	84	≥85*	≥85*	≥86*	≥87*	≥87*	≥88*	≥88*	≥85*
Rw REFERENCE CURVE	55	58	61	64	67	70	73	74	75	76	77	78	78	78	78	78	-	-

* The Performance of the sample was such that the measured levels in the receive room were less than 6dB above measured background noise levels. The measured sound transmission loss is consequently given as equal too or greater than the figure presented and that this value is at the limit of measurement.

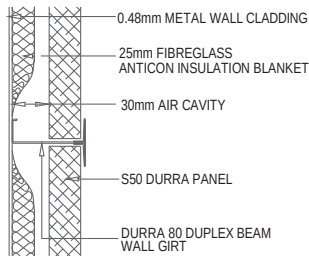


Durra Wall Systems

Quick Reference Guide: Sound Transmission Loss - Insul Predictions + / - 3 STC

 0.48mm METAL WALL CLADDING 75mm X 18kg/m³ FIBREGLASS ANTICON INSULATION BLANKET 125mm AIR CAVITY S50 DURRA PANEL DURRA 175 I-BEAM WALL GIRT	Durra 175 I-Beam Wall Girt <table><tr><th>FREQUENCY (Hz)</th><td>63</td><td>125</td><td>250</td><td>500</td><td>1K</td><td>2K</td><td>4K</td></tr><tr><th>TRANSMISSION LOSS (dB)</th><td>17</td><td>23</td><td>39</td><td>49</td><td>57</td><td>62</td><td>72</td></tr></table> Reference ST - 31.1	FREQUENCY (Hz)	63	125	250	500	1K	2K	4K	TRANSMISSION LOSS (dB)	17	23	39	49	57	62	72	STC 47
FREQUENCY (Hz)	63	125	250	500	1K	2K	4K											
TRANSMISSION LOSS (dB)	17	23	39	49	57	62	72											
 0.48mm METAL WALL CLADDING 75mm X 18kg/m³ FIBREGLASS ANTICON INSULATION BLANKET 150mm AIR CAVITY S50 DURRA PANEL DURRA 200 I-BEAM WALL GIRT	Durra 200 I-Beam Wall Girt <table><tr><th>FREQUENCY (Hz)</th><td>63</td><td>125</td><td>250</td><td>500</td><td>1K</td><td>2K</td><td>4K</td></tr><tr><th>TRANSMISSION LOSS (dB)</th><td>16</td><td>25</td><td>40</td><td>50</td><td>57</td><td>62</td><td>72</td></tr></table> Reference ST - 31.2	FREQUENCY (Hz)	63	125	250	500	1K	2K	4K	TRANSMISSION LOSS (dB)	16	25	40	50	57	62	72	STC 49
FREQUENCY (Hz)	63	125	250	500	1K	2K	4K											
TRANSMISSION LOSS (dB)	16	25	40	50	57	62	72											
 0.48mm METAL WALL CLADDING 75mm X 18kg/m³ FIBREGLASS ANTICON INSULATION BLANKET 175mm AIR CAVITY S50 DURRA PANEL DURRA 225 I-BEAM WALL GIRT	Durra 225 I-Beam Wall Girt <table><tr><th>FREQUENCY (Hz)</th><td>63</td><td>125</td><td>250</td><td>500</td><td>1K</td><td>2K</td><td>4K</td></tr><tr><th>TRANSMISSION LOSS (dB)</th><td>16</td><td>28</td><td>42</td><td>50</td><td>57</td><td>62</td><td>72</td></tr></table> Reference ST - 31.3	FREQUENCY (Hz)	63	125	250	500	1K	2K	4K	TRANSMISSION LOSS (dB)	16	28	42	50	57	62	72	STC 51
FREQUENCY (Hz)	63	125	250	500	1K	2K	4K											
TRANSMISSION LOSS (dB)	16	28	42	50	57	62	72											
 0.48mm METAL WALL CLADDING 75mm X 18kg/m³ FIBREGLASS ANTICON INSULATION BLANKET 200mm AIR CAVITY S50 DURRA PANEL DURRA 250 I-BEAM WALL GIRT	Durra 250 I-Beam Wall Girt <table><tr><th>FREQUENCY (Hz)</th><td>63</td><td>125</td><td>250</td><td>500</td><td>1K</td><td>2K</td><td>4K</td></tr><tr><th>TRANSMISSION LOSS (dB)</th><td>16</td><td>28</td><td>43</td><td>50</td><td>57</td><td>62</td><td>72</td></tr></table> Reference ST - 31.4	FREQUENCY (Hz)	63	125	250	500	1K	2K	4K	TRANSMISSION LOSS (dB)	16	28	43	50	57	62	72	STC 52
FREQUENCY (Hz)	63	125	250	500	1K	2K	4K											
TRANSMISSION LOSS (dB)	16	28	43	50	57	62	72											
 0.48mm METAL WALL CLADDING 75mm X 18kg/m³ FIBREGLASS ANTICON INSULATION BLANKET 250mm AIR CAVITY S50 DURRA PANEL DURRA 300 I-BEAM WALL GIRT	Durra 300 I-Beam Wall Girt <table><tr><th>FREQUENCY (Hz)</th><td>63</td><td>125</td><td>250</td><td>500</td><td>1K</td><td>2K</td><td>4K</td></tr><tr><th>TRANSMISSION LOSS (dB)</th><td>16</td><td>30</td><td>40</td><td>50</td><td>57</td><td>62</td><td>72</td></tr></table> Reference ST - 31.5	FREQUENCY (Hz)	63	125	250	500	1K	2K	4K	TRANSMISSION LOSS (dB)	16	30	40	50	57	62	72	STC 52
FREQUENCY (Hz)	63	125	250	500	1K	2K	4K											
TRANSMISSION LOSS (dB)	16	30	40	50	57	62	72											
 0.48mm METAL WALL CLADDING 75mm X 18kg/m³ FIBREGLASS ANTICON INSULATION BLANKET 300mm AIR CAVITY S50 DURRA PANEL DURRA 350 I-BEAM WALL GIRT	Durra 350 I-Beam Wall Girt <table><tr><th>FREQUENCY (Hz)</th><td>63</td><td>125</td><td>250</td><td>500</td><td>1K</td><td>2K</td><td>4K</td></tr><tr><th>TRANSMISSION LOSS (dB)</th><td>17</td><td>31</td><td>41</td><td>50</td><td>57</td><td>62</td><td>72</td></tr></table> Reference ST - 31.6	FREQUENCY (Hz)	63	125	250	500	1K	2K	4K	TRANSMISSION LOSS (dB)	17	31	41	50	57	62	72	STC 52
FREQUENCY (Hz)	63	125	250	500	1K	2K	4K											
TRANSMISSION LOSS (dB)	17	31	41	50	57	62	72											

Quick Reference Guide: Sound Transmission Loss - Insul Predictions + / - 3 STC



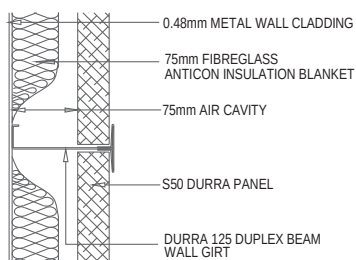
Durra 80 Duplex Beam Wall Girt

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	19	21	25	41	54	60	71

Reference ST - 32.1

STC

38



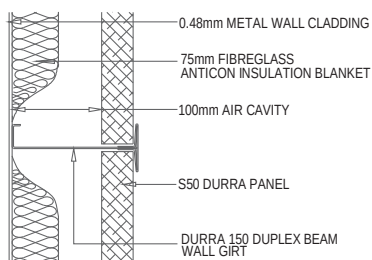
Durra 125 Duplex Beam Wall Girt

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	18	18	35	50	57	62	72

Reference ST - 32.2

STC

42



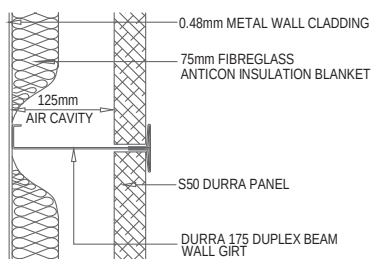
Durra 150 Duplex Beam Wall Girt

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	20	24	39	53	57	62	72

Reference ST - 32.3

STC

48



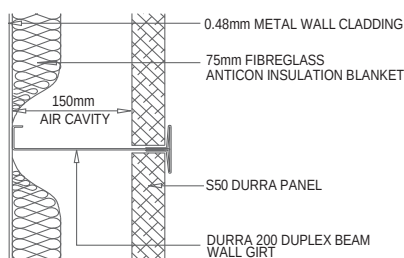
Durra 175 Duplex Beam Wall Girt

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	17	23	39	49	57	62	72

Reference ST - 32.4

STC

47



Durra 200 Duplex Beam Wall Girt

FREQUENCY (Hz)	63	125	250	500	1K	2K	4K
TRANSMISSION LOSS (dB)	16	25	40	50	57	62	72

Reference ST - 32.5

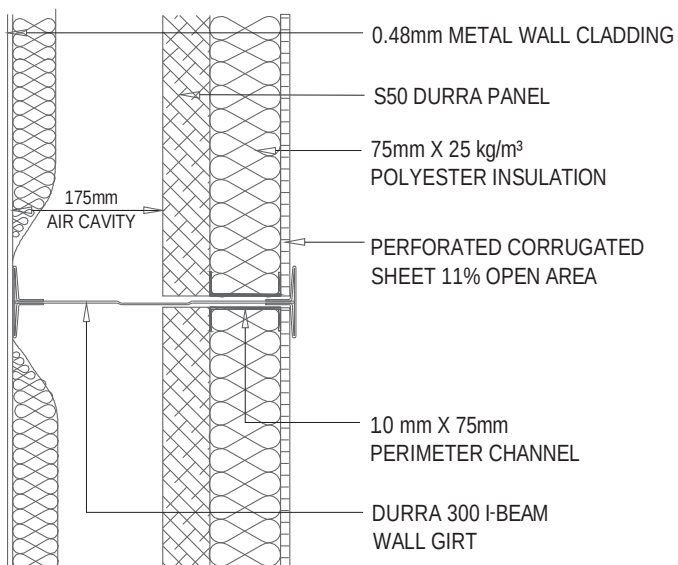
STC

49

Sound Absorption - NRC 0.85

Durra Wall System: S50 Durra Panel Soundsorb: Perforated Corrugated 75/25

Product Details



REFERENCE: **SA - 21**

TESTED:

Durra Panel: S50 Soundsorb: Perforated Corrugated, Cassette: Polyester 75mm x 25kg/m³

Wall Girt: Durra 300 I-Beam

Air Cavity: 175mm

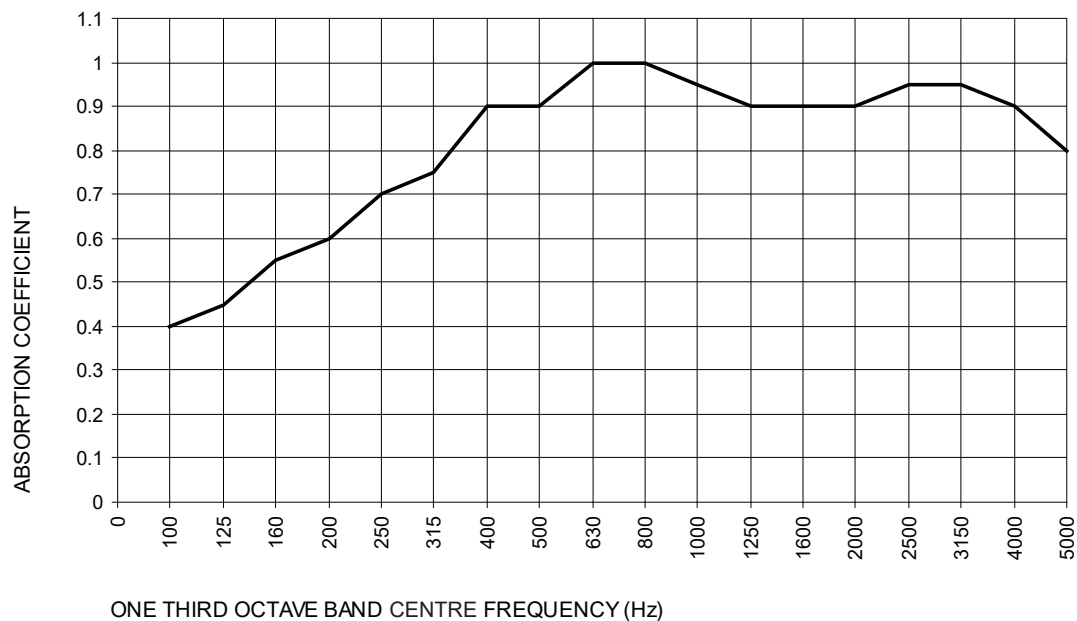
Insulation: 50mm Fibreglass Anticon Insulation Blanket

Cladding: 0.48mm Metal Wall Cladding

REPORT: 1211/832/PD
AS 1045-1988
RMIT

Performance Data

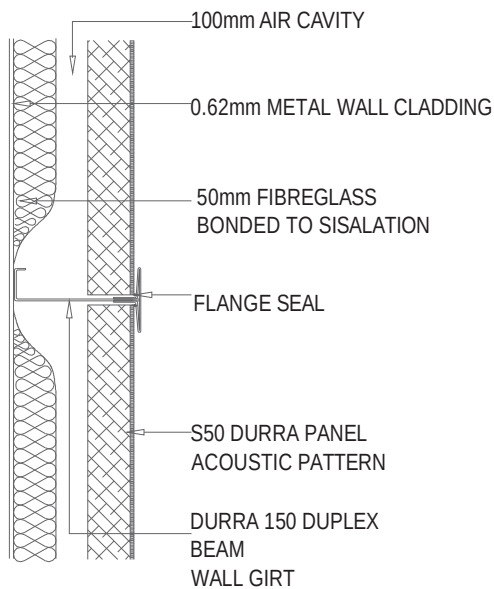
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
ABSORPTION COEFFICIENT	.40	.45	.55	.60	.70	.75	.90	.90	1.0	1.0	.95	.90	.90	.90	.95	.95	.90	.80



Sound Transmission Loss - STC 42

Durra Wall System: S50 Durra Panel Acoustic Pattern: Plain

Product Details



REFERENCE: **ST - 32**

TESTED:

Durra Panel: S50 Acoustic Pattern: Plain

Wall Girt: Durra 150 Duplex Beam

Air Cavity: 100mm

Insulation: 50mm Fibreglass Anticon Insulation Blanket

Cladding: 0.62mm Metal Wall Cladding

REPORT:

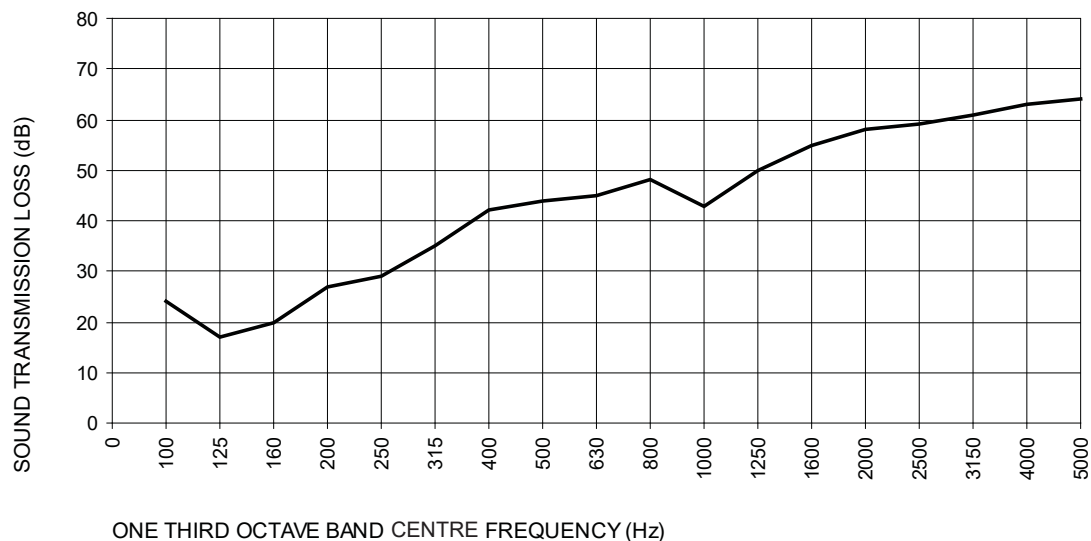
NATA 121/03-035/PD

AS 1191-1985

RMIT

Performance Data

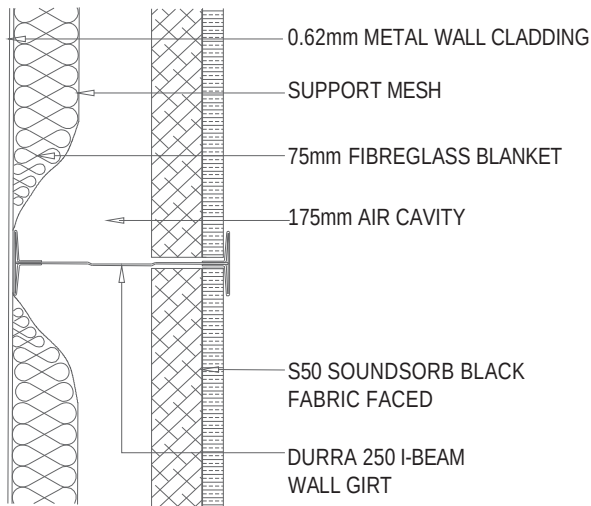
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	24	17	20	27	29	35	42	44	45	48	43	50	55	58	59	61	63	64



Sound Transmission Loss - STC 48

Durra Wall System: S50 Durra Panel Soundsorb: Fabric Faced

Product Details



REFERENCE: **ST - 33**

TESTED:

Durra Panel: S50 Soundsorb black fabric faced

Wall Girt: Durra 250 I-Beam

Air Cavity: 175mm

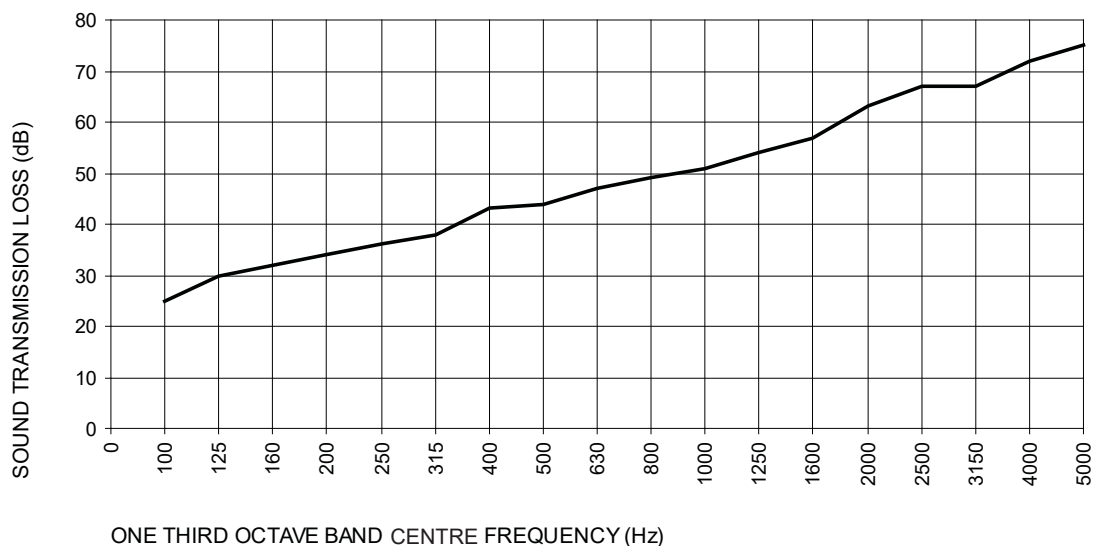
Insulation: 75mm Fibreglass Blanket

Cladding: 0.62mm Metal Wall Cladding

REPORT: 354BA/162/4517-1
AS1276-1979
Louis A. Challis & Associates

Performance Data

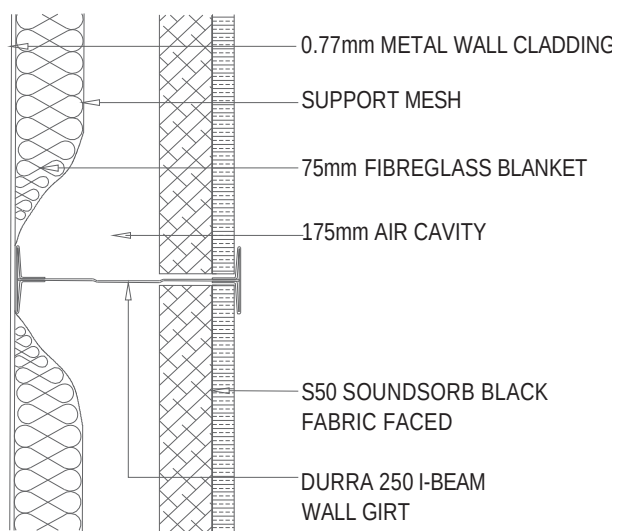
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	25	30	32	34	36	38	43	44	47	49	51	54	57	63	67	67	72	75



Sound Transmission Loss - STC 49

Durra Wall System: S50 Durra Panel Soundsorb: Fabric Faced

Product Details



REFERENCE: **ST - 34**

TESTED:

Durra Panel: S50 Soundsorb black fabric faced

Wall Girt: Durra 250 I-Beam

Air Cavity: 175mm

Insulation: 75mm Fibreglass Blanket

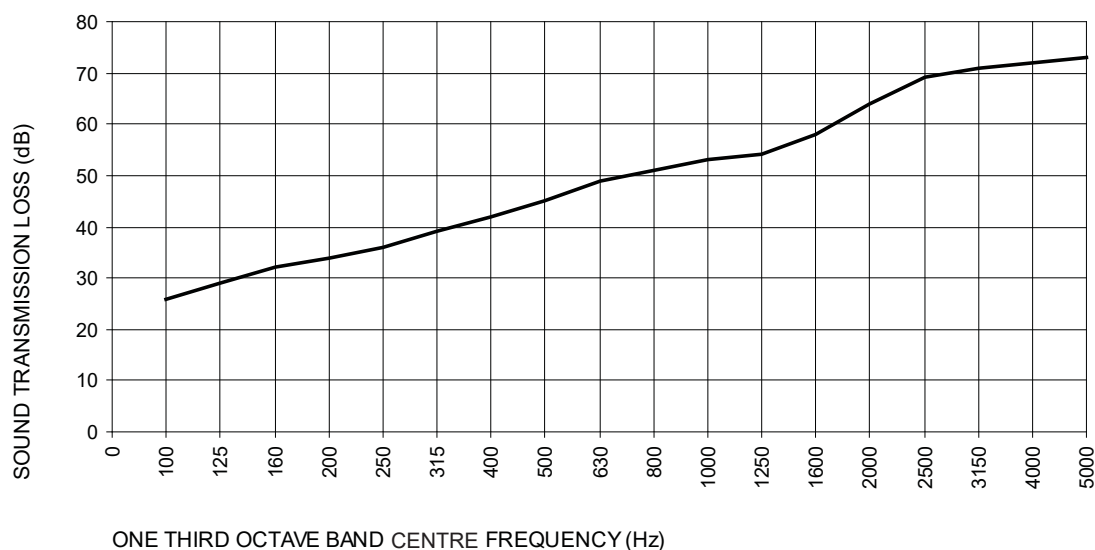
Cladding: 0.77mm Metal Wall Cladding

REPORT: 3667/159/4517 B-4-83
AS 1276-1979

Louis A. Challis & Associates

Performance Data

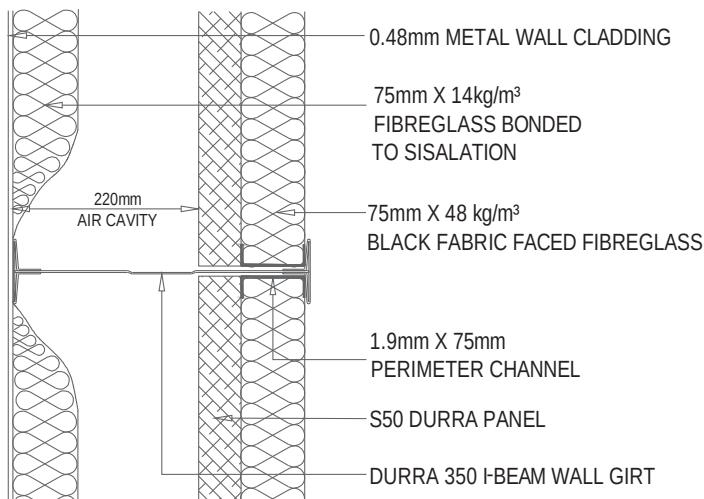
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	26	29	32	34	36	39	42	45	49	51	53	54	58	64	69	71	72	73



Sound Transmission Loss - Rw 52

Durra Wall System: S50 Durra Panel Soundsorb: Fabric Faced 75/48

Product Details



REFERENCE: **ST - 31**

TESTED:

Durra Panel: S50 Soundsorb: Black fabric faced. Cassette: Fibreglass 75mm x 48kg/m³

Wall Girt: Durra 350 I-Beam

Air Cavity: 220mm

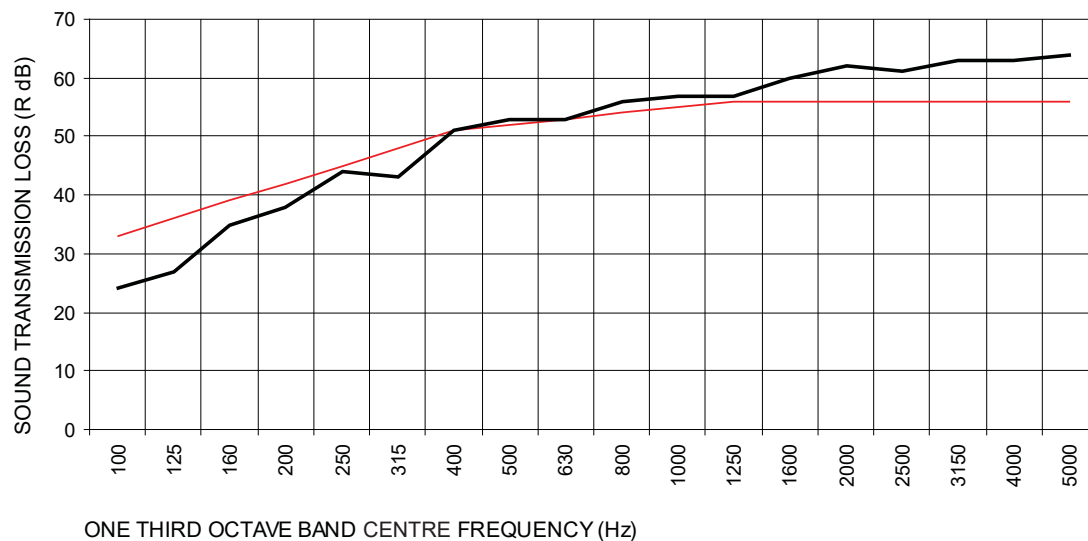
Insulation: 75mm Fibreglass Anticon Insulation Blanket

Cladding: 0.48mm Metal Wall Cladding

REPORT: NATA 1211/03-035/PD
AS 1191-1985
RMIT

Performance Data

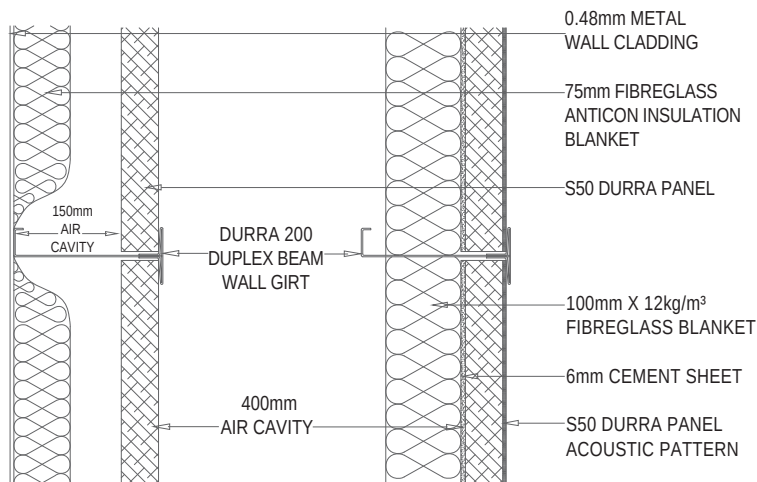
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	24	27	35	38	44	43	51	53	53	56	57	57	60	62	61	63	63	64
Rw REFERENCE CURVE	33	36	39	42	45	48	51	52	53	54	55	56	56	56	56	56	56	56



Sound Transmission Loss - RW 74

Durra Wall System: Double Layer - S50 Durra Panel Acoustic Pattern Clad 6mm Cement Sheet & S50 Plain

Product Details



REFERENCE: ST - 36

TESTED:

Durra Panel: S50 Acoustic Pattern Clad 1 Face
(Double layer) 6mm Cement Sheet
S50 Plain

Wall Girt: Durra 200 Duplex Beam
(Double Girt) Durra 200 Duplex Beam

Air Cavity: 400mm
(Double Cavity) 150mm

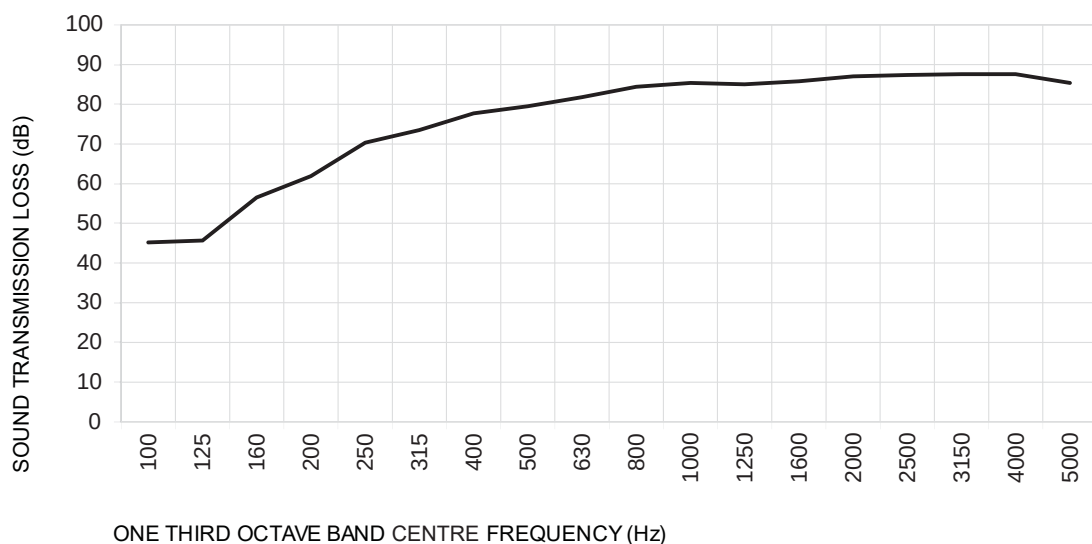
Insulation: 100mm Fibreglass Blanket
(Double Insulation) 75mm Fibreglass Anticon Roofing Blanket

Cladding: 0.48mm Wall Sheeting

REPORT: NATA 1211/11-190/PD
AS 1191-1985
RMIT

Performance Data

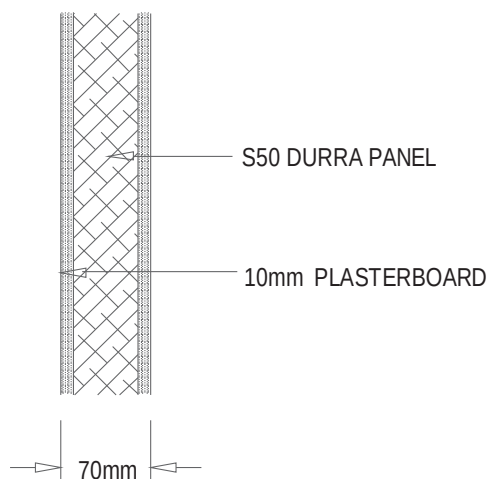
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K
TRANSMISSION LOSS (dB)	45	46	57	62	70	74	78	80	82	84	≥85*	≥85*	≥86*	≥87*	≥87*	≥88*	≥88*	≥85*
Rw REFERENCE CURVE	55	58	61	64	67	70	73	74	75	76	77	78	78	78	78	78	-	-



Sound Transmission Loss - STC 31

Durra Wall System: S50 Durra Panel Clad - 10mm Plasterboard

Product Details



REFERENCE: **ST - 14**

TESTED:

Durra Panel: S50 Plain

Wall Girt: Not specified

Air Cavity: None

Insulation: None

Cladding: Both sides - 10mm Plasterboard

REPORT:

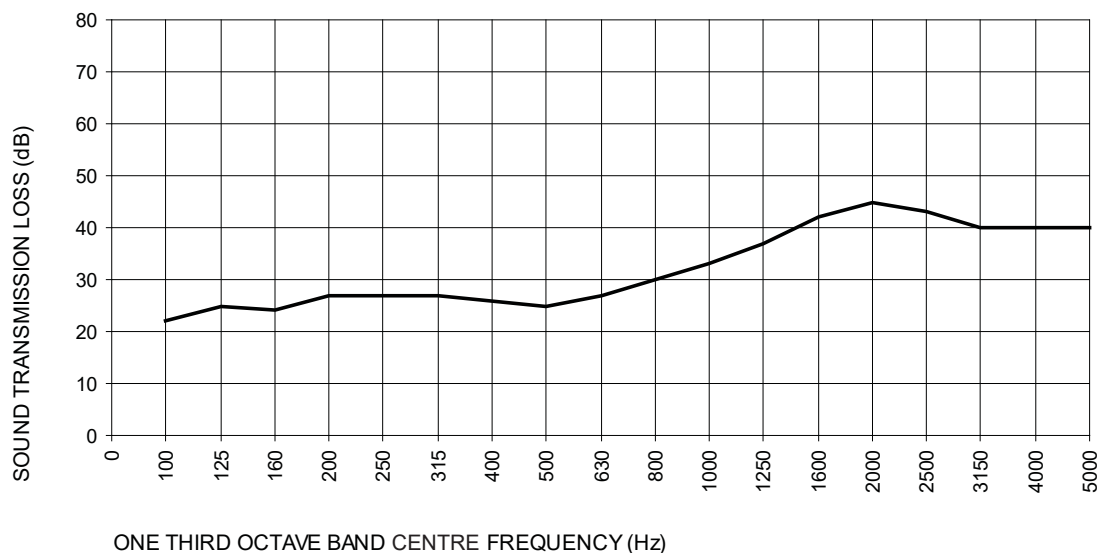
121021

AS 1278-1979

Louis A. Challis & Associates

Performance Data

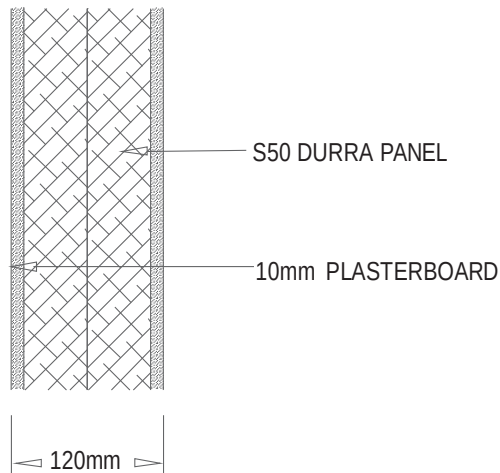
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	22	25	24	27	27	27	26	25	27	30	33	37	42	45	43	40	40	40



Sound Transmission Loss - STC 37

Durra Wall System: Double S50 Durra Panel Clad - 10mm Plasterboard

Product Details



REFERENCE: **ST - 13**

TESTED:

Durra Panel: Double S50 Plain

Wall Girt: Not specified

Air Cavity: None

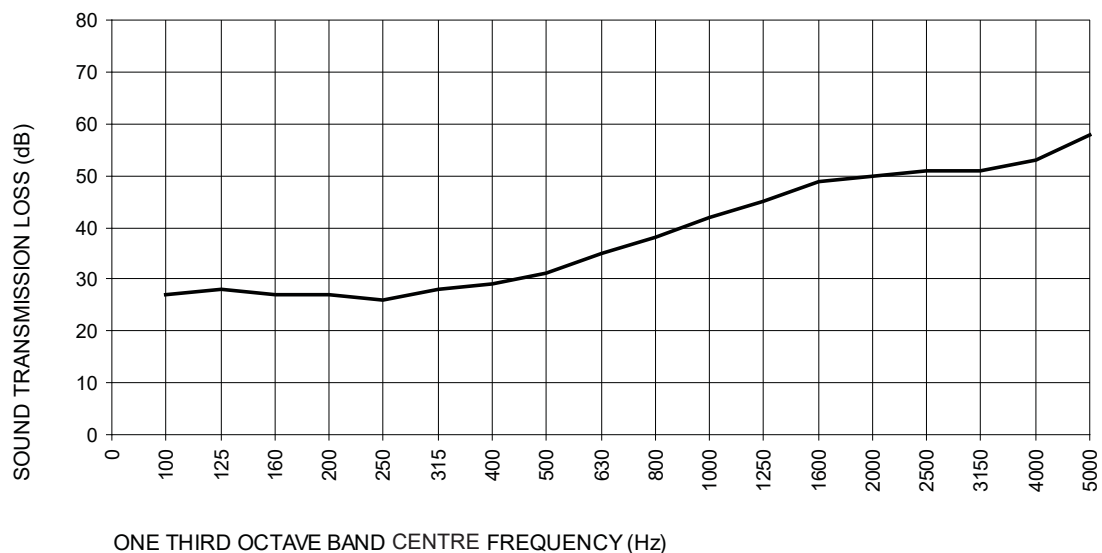
Insulation: None

Cladding: Both sides - 10mm Plasterboard

REPORT: 121020 R
AS 1276-1979
RMIT

Performance Data

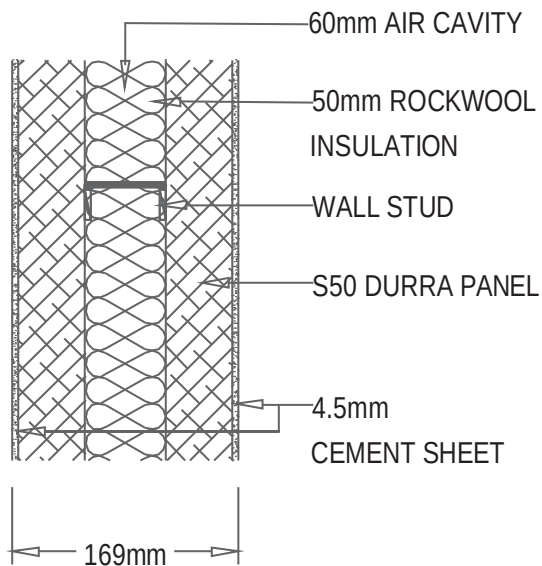
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	27	28	27	27	26	28	29	31	35	38	42	45	49	50	51	51	53	58



Sound Transmission Loss - STC 43

Durra Wall System: Double S50 Durra Panel Clad - 4.5mm Cement Sheet

Product Details



REFERENCE: **ST - 12**

TESTED:

Durra Panel: Double S50 Plain

Wall Girt: 60 Channel

Air Cavity: 60mm

Insulation: 50mm Rockwool Blanket

Cladding: Both sides - 4.5mm Cement sheet

REPORT:

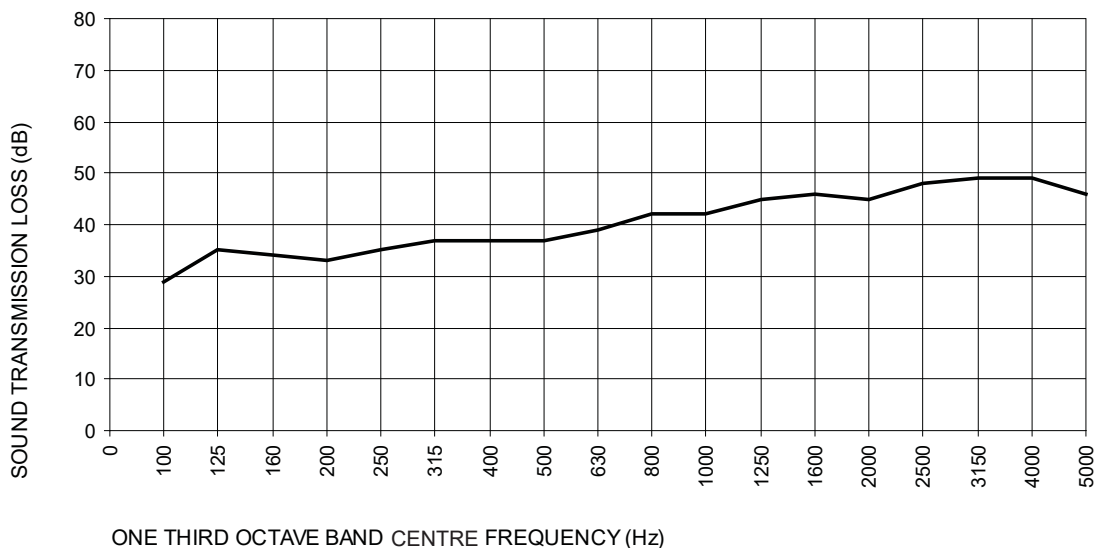
79/2942

ASTM E 413/73

Wait-Aid Ltd

Performance Data

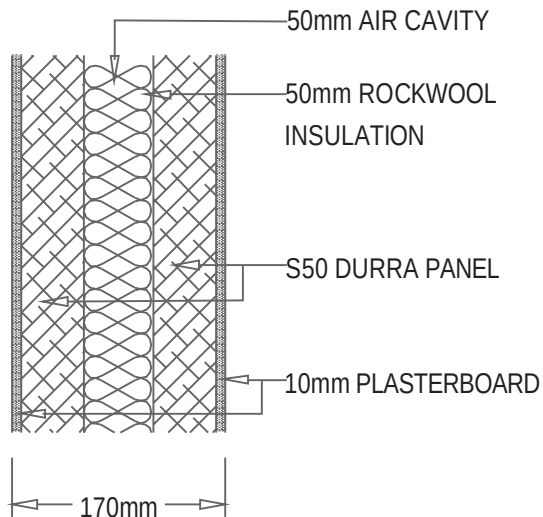
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	29	35	34	33	35	37	37	37	39	42	42	45	46	45	48	49	49	46



Sound Transmission Loss - STC 53

Durra Wall Disconnected System: Double S50 Durra Panel Clad - 10mm Plasterboard

Product Details



REFERENCE: **ST - 15**

TESTED:

Durra Panel: Double S50 Plain

Wall Girt: None - disconnected system

Air Cavity: 50mm

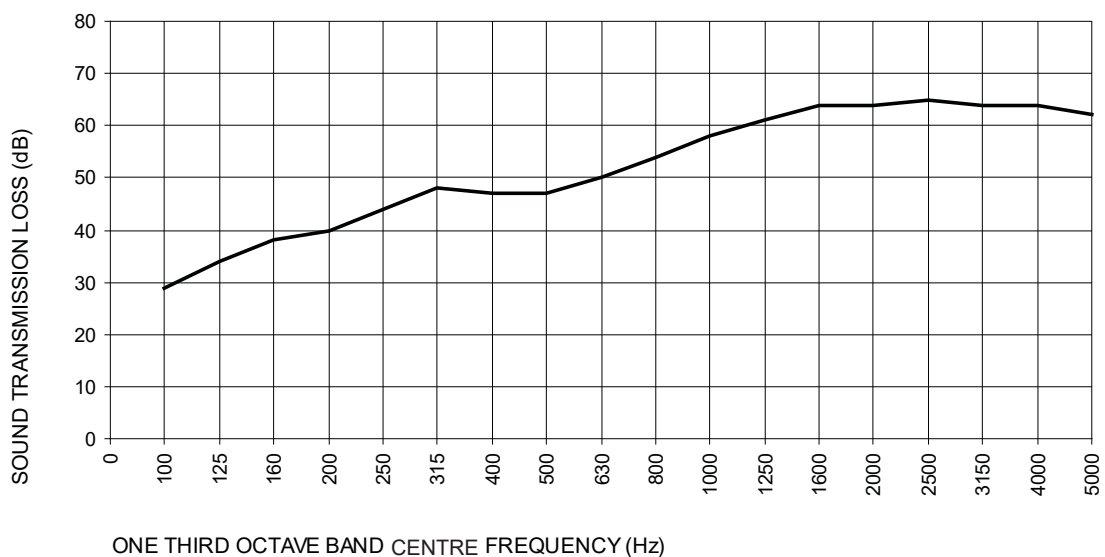
Insulation: 50mm Rockwool Blanket

Cladding: Both sides - 10mm Plasterboard

REPORT: 121023 R
AS 1191-1976
RMIT

Performance Data

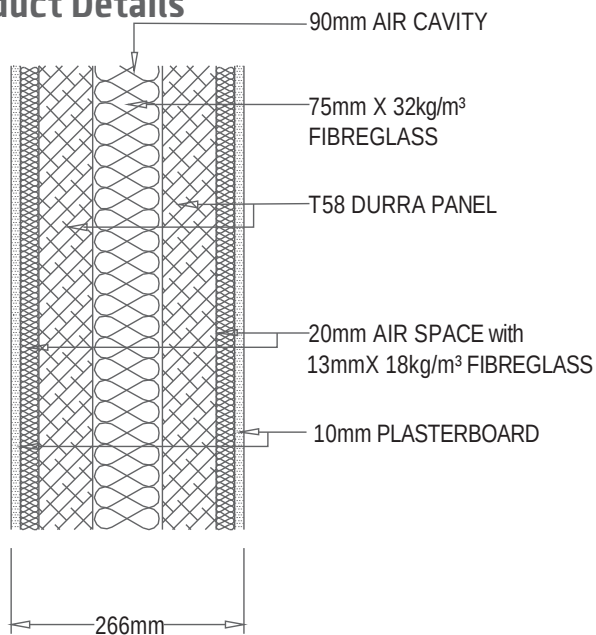
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	29	34	38	40	44	48	47	47	50	54	58	61	64	64	65	64	64	62



Sound Transmission Loss - Rw 57

Durra Wall Disconnected System: Double S58 Durra Panel Clad - 10mm Plasterboard

Product Details



REFERENCE: **ST - 16**

TESTED:

Durra Panel: Double S58 Plain

Wall Girt: None - disconnected system

Air Cavity: Internal: 90mm
Furring channel: 20mm

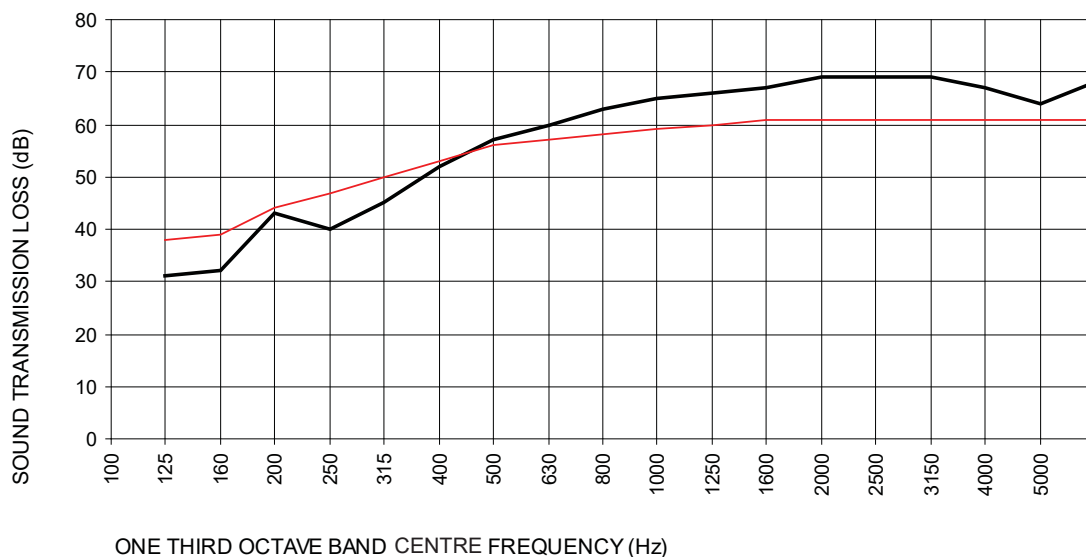
Insulation: 75mm Fibreglass blanket
13mm x 2 Fibreglass blanket

Cladding: Both sides - 10mm Plasterboard

REPORT: 121I/01-055/PD
AS 1191-1985
RMIT

Performance Data

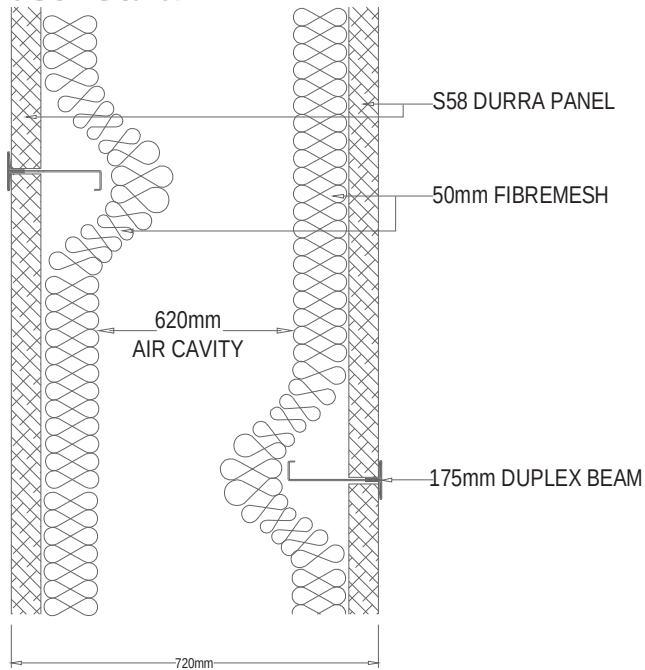
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	31	32	43	40	45	52	57	60	63	65	66	67	69	69	69	67	64	68
Rw REFERENCE CURVE	38	39	44	47	50	53	56	57	58	59	60	61	61	61	61	61	61	61



Sound Transmission Loss - Rw 72

Durra Cinema Wall System: Double S58 Durra Panel: Plain

Product Details



REFERENCE: **ST - 17**

TESTED:

Durra Panel: Double S58 Plain

Wall Girt: Durra 175 Duplex Beam
Spaced at 1200mm centres

Air Cavity: 620mm

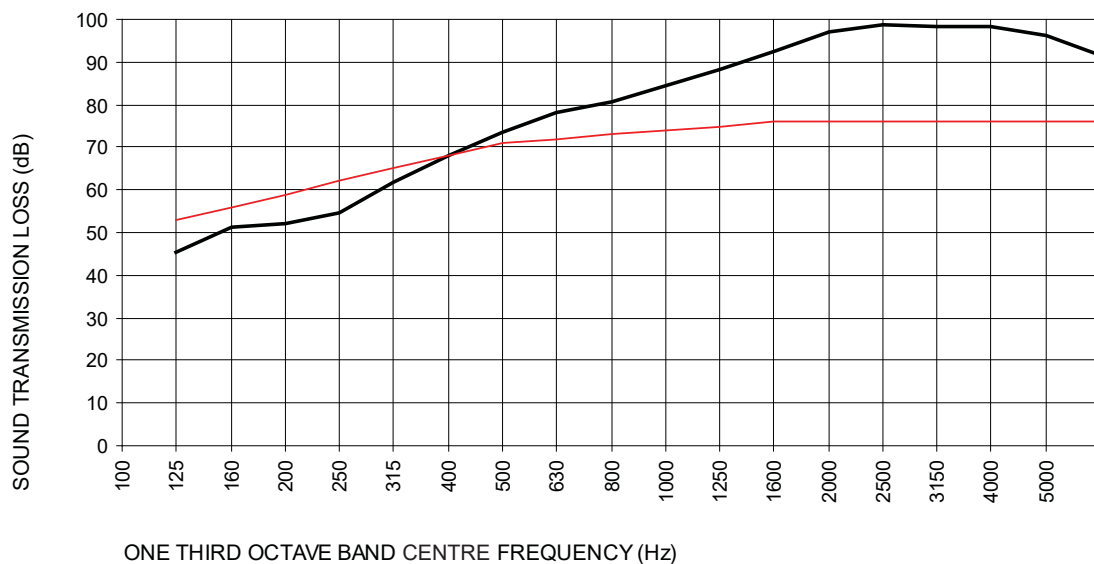
Insulation: 50mm Fibremesh

Cladding: None specified

REPORT: 121/05-118/PD
AS 1191-2002
RMIT

Performance Data

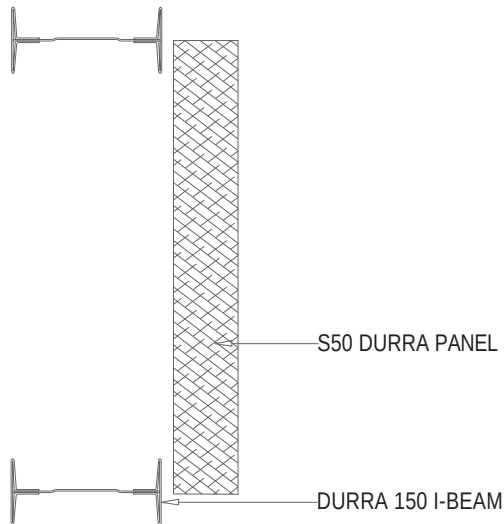
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	45.3	51.2	52.2	54.8	61.8	67.9	73.4	78	80.8	84.6	88.2	92.6	97	98.9	98.5	98.4	96.2	91.7
Rw REFERENCE CURVE	53	56	59	62	65	68	71	72	73	74	75	76	76	76	76	76	76	76



Sound Transmission Loss - STC 32

Durra Wall Disconnected System: S50 Durra Panel Plain

Product Details



REFERENCE: **ST - 19**

TESTED:

Durra Panel: S50 Plain

Wall Girt: Durra 150 I-Beam

Air Cavity: None

Insulation: None

Cladding: None

Not Shown: Wing isolation clips attached from Durra 150 I-Beam to S50 Durra Panel

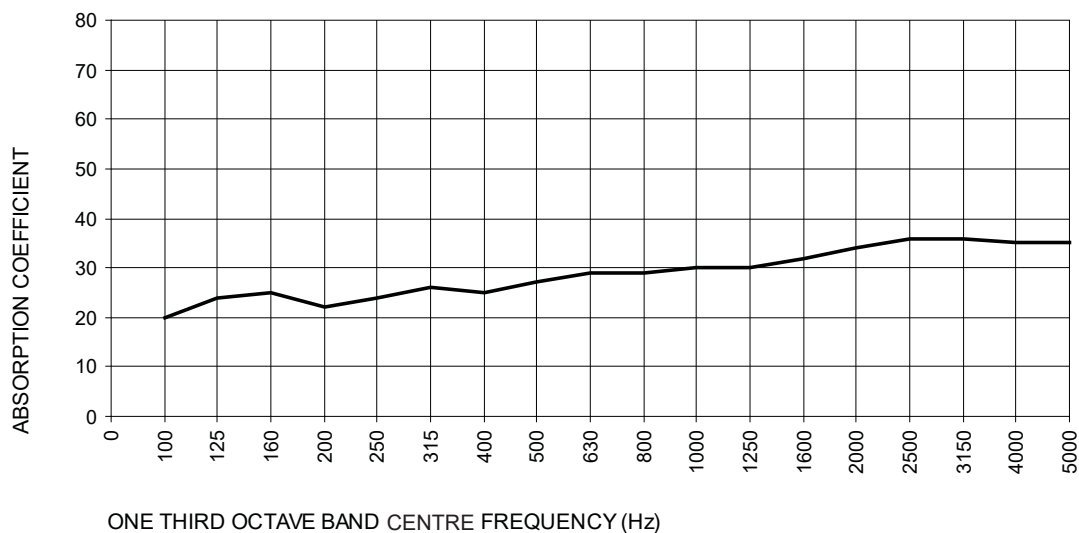
REPORT:

Test #1

AS-TL2653

Performance Data

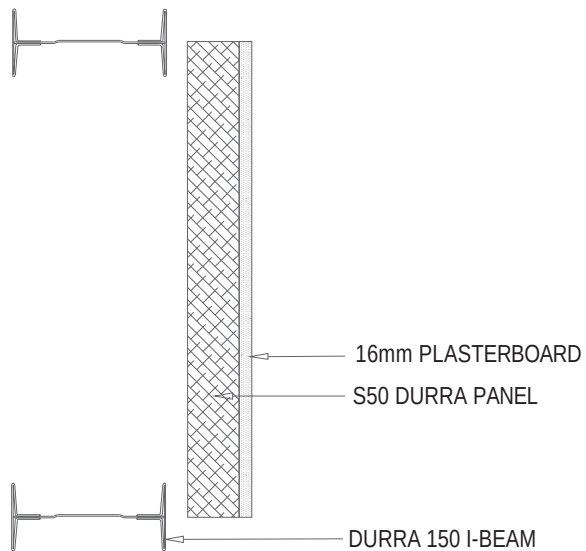
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	-	24	25	22	24	26	25	27	29	29	30	30	32	34	36	36	35	35



Sound Transmission Loss - STC 36

Durra Wall Disconnected System: S50 Durra Panel Plain Clad - 16mm Plasterboard

Product Details



REFERENCE: **ST - 20**

TESTED:

Durra Panel: S50 Plain

Wall Girt: Durra 150 I-Beam

Air Cavity: None

Insulation: None

Cladding: One Face: 16mm Plasterboard

Not Shown: Wing isolation clips attached from Durra 150 I-Beam to S50 Durra Panel

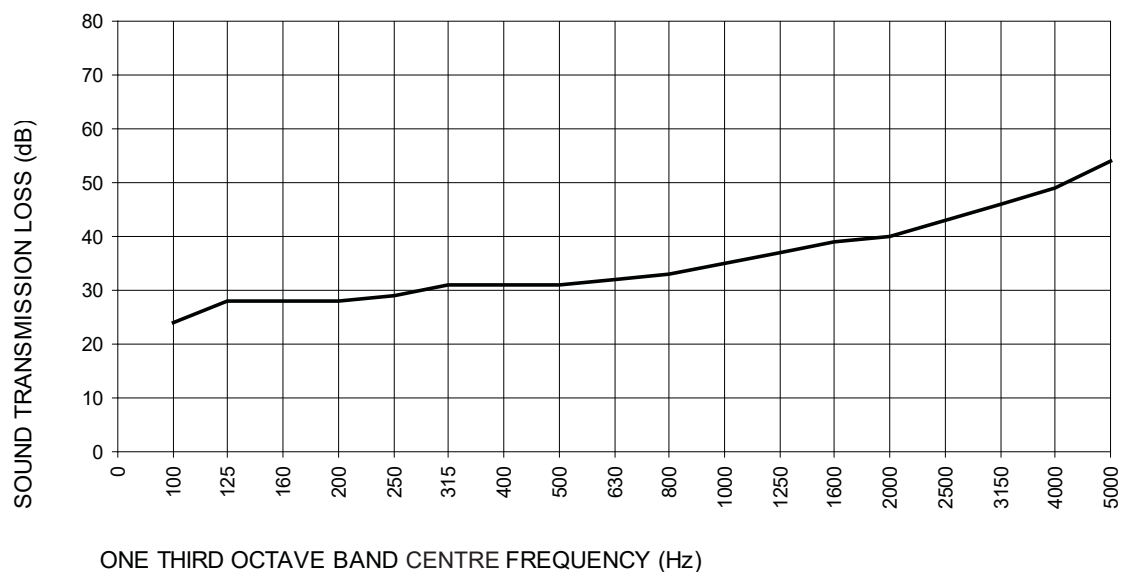
REPORT:

Test #4

AS-TL2655

Performance Data

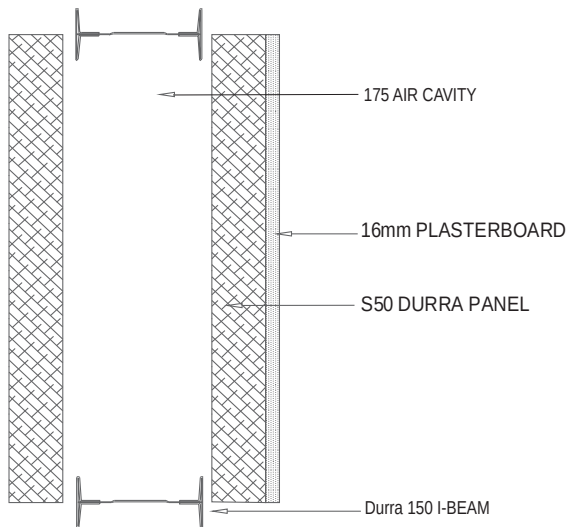
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	24	28	28	28	29	31	31	31	32	33	35	37	39	40	43	46	49	54



Sound Transmission Loss - STC 55

Durra Wall Semi Disconnected System: Double S50 Durra Panel Plain Clad - 16mm Plasterboard

Product Details



REFERENCE: **ST - 21**

TESTED:

Durra Panel: Double S50 Plain

Wall Girt: Durra 150 I-Beam

Air Cavity: 175mm

Insulation: None

Cladding: One Face: 16mm Plasterboard

Not Shown: Wing isolation clips attached from Durra 150 I-Beam to S50 Durra Panel

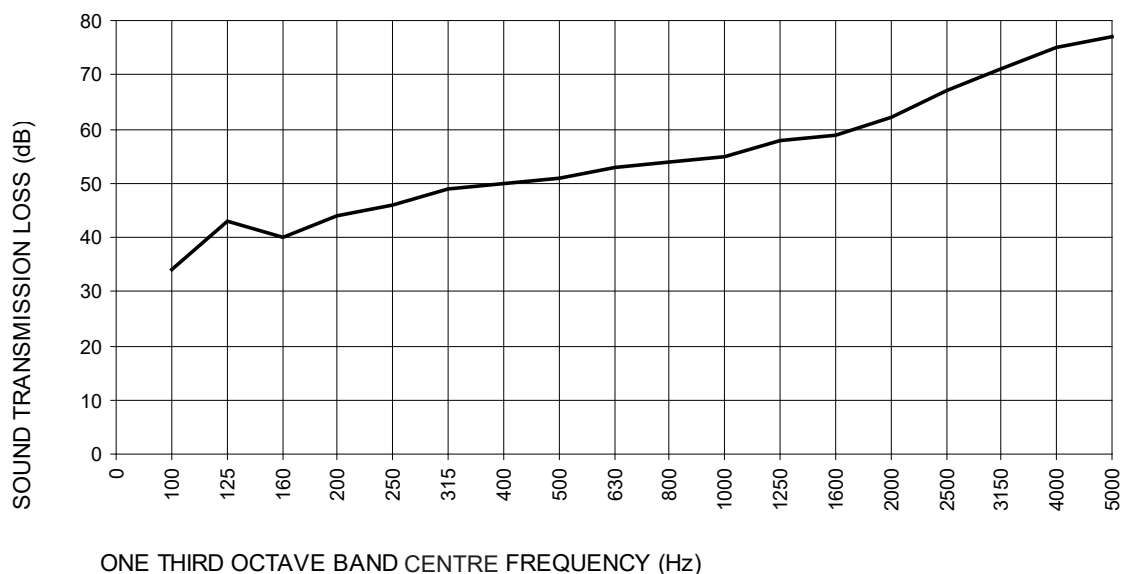
REPORT:

Test #5

AS-TL2656

Performance Data

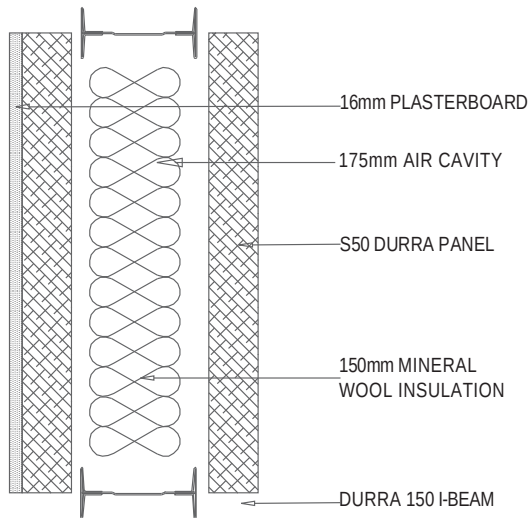
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	34	43	40	44	46	49	50	51	53	54	55	58	59	62	67	71	75	77



Sound Transmission Loss - STC 62

Durra Wall Semi Disconnected System: Double S50 Durra Panel Plain Clad - 16mm Plasterboard

Product Details



REFERENCE: **ST - 22**

TESTED:

Durra Panel: Double S50 Plain

Wall Girt: Durra 150 I-Beam

Air Cavity: 175mm

Insulation: 150mm Mineral Wool

Cladding: One Face: 16mm Plasterboard

Not Shown: Wing isolation clips attached from Durra 150 I-Beam to S50 Durra Panel

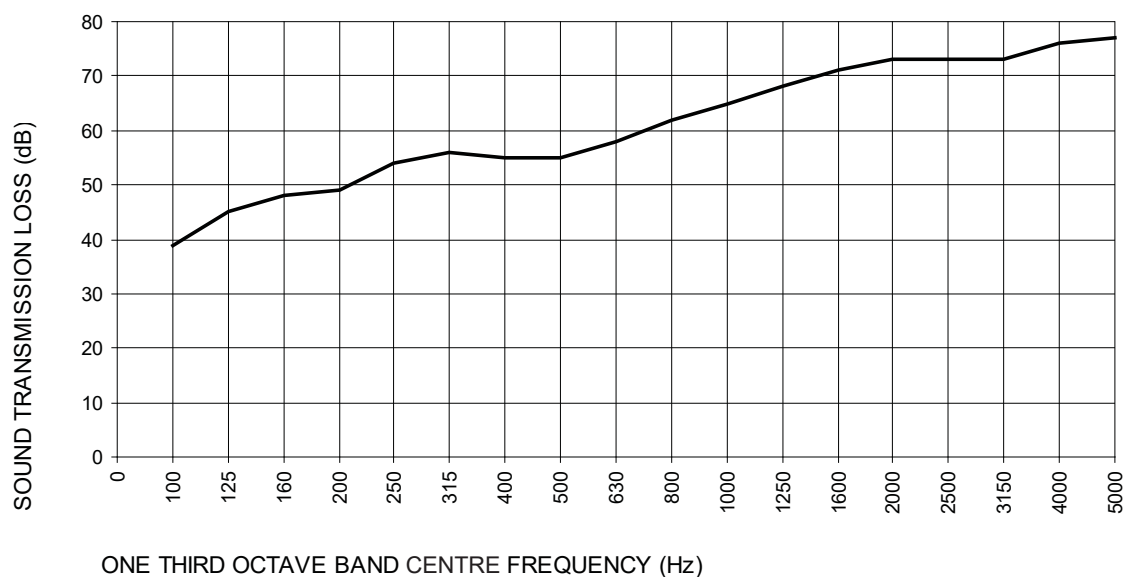
REPORT:

Test #6

AS-TL2657

Performance Data

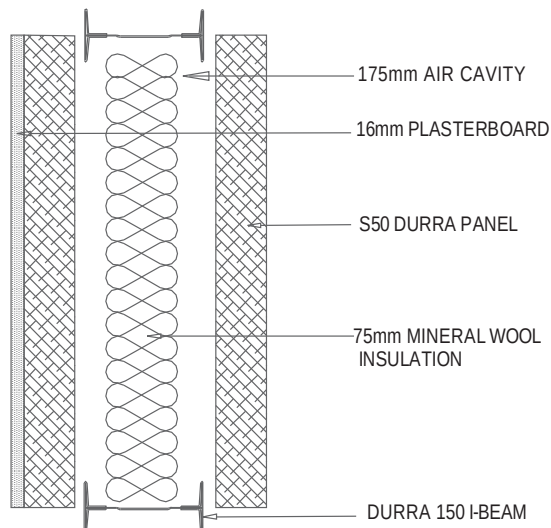
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	39	45	48	49	54	56	55	55	58	62	65	68	71	73	73	73	76	77



Sound Transmission Loss - STC 63

Durra Wall Semi Disconnected System: Double S50 Durra Panel Plain Clad - 16mm Plasterboard

Product Details



REFERENCE: **ST - 23**

TESTED:

Durra Panel: Double S50 Plain

Wall Girt: Durra 150 I-Beam

Air Cavity: 175mm

Insulation: 75mm Mineral Wool

Cladding: One Face: 16mm Plasterboard

Not Shown: Wing isolation clips attached from Durra 150 I-Beam to S50 Durra Panel

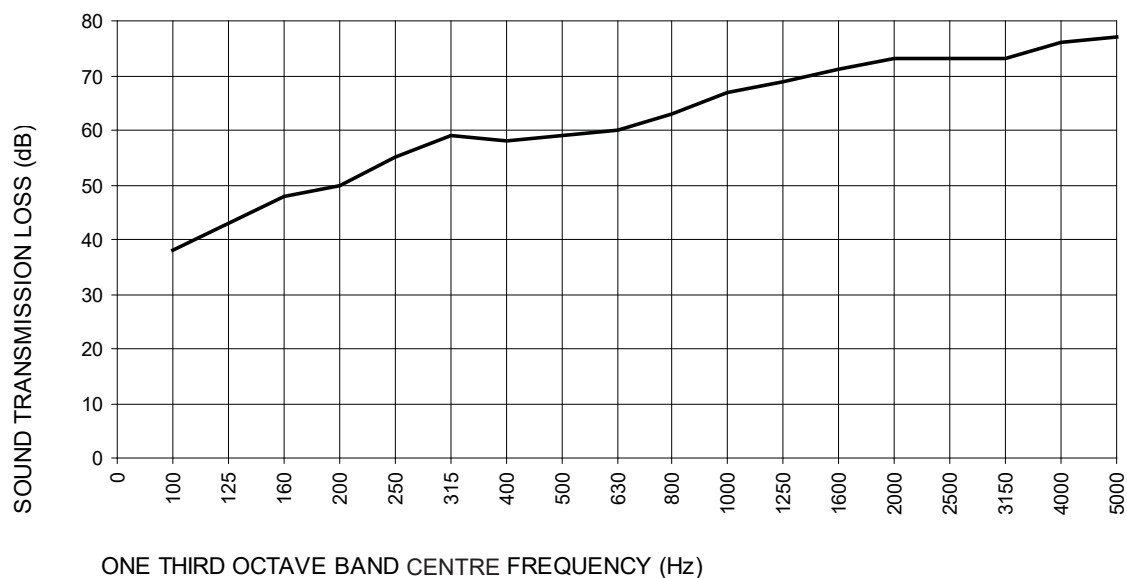
REPORT:

Test #7

AS-TL2658

Performance Data

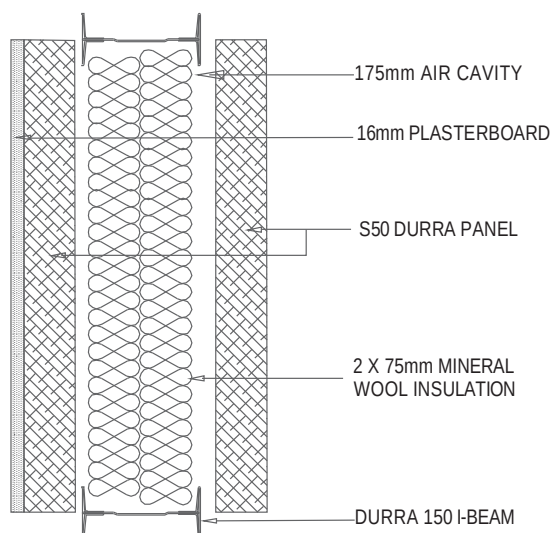
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	38	43	48	50	55	59	58	59	60	63	67	69	71	73	73	73	76	77



Sound Transmission Loss - STC 63

Durra Wall Semi Disconnected System: Double S50 Durra Panel Plain Clad - 16mm Plasterboard

Product Details



REFERENCE: **ST - 24**

TESTED:

Durra Panel: Double S50 Plain

Wall Girt: Durra 150 I-Beam

Air Cavity: 175mm

Insulation: 2 x 75mm Mineral Wool

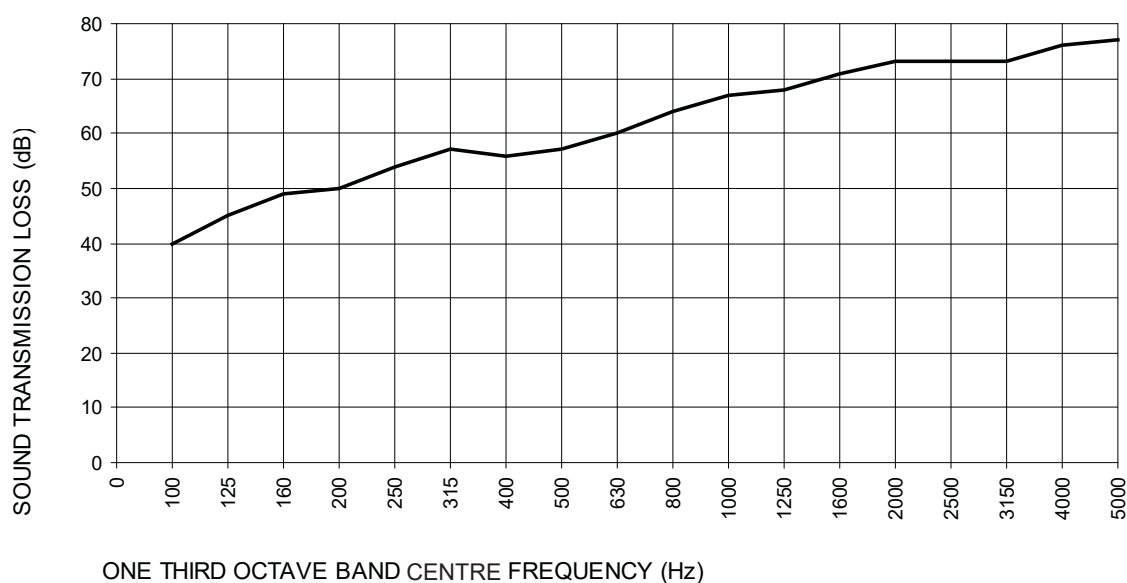
Cladding: One Face: 16mm Plasterboard

Not Shown: Wing isolation clips attached from Durra 150 I-Beam to S50 Durra Panel

REPORT: Test #8
AS-TL2659

Performance Data

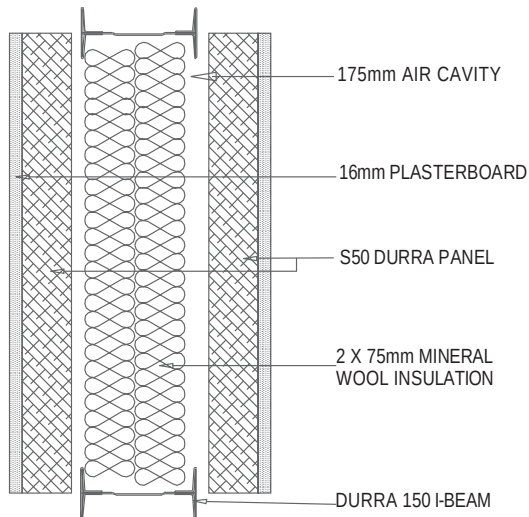
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	40	45	49	50	54	57	56	57	60	64	67	68	71	73	73	73	76	77



Sound Transmission Loss - STC 65

Durra Wall Semi Disconnected System: Double S50 Durra Panel Plain Clad both sides - 16mm Plasterboard

Product Details



REFERENCE: **ST - 25**

TESTED:

Durra Panel: Double S50 Plain

Wall Girt: Durra 150 I-Beam

Air Cavity: 175mm

Insulation: 2 x 75mm Mineral Wool

Cladding: Two Faces - 16mm Plasterboard

Not Shown: Wing isolation clips attached from Durra 150 I-Beam to S50 Durra Panel

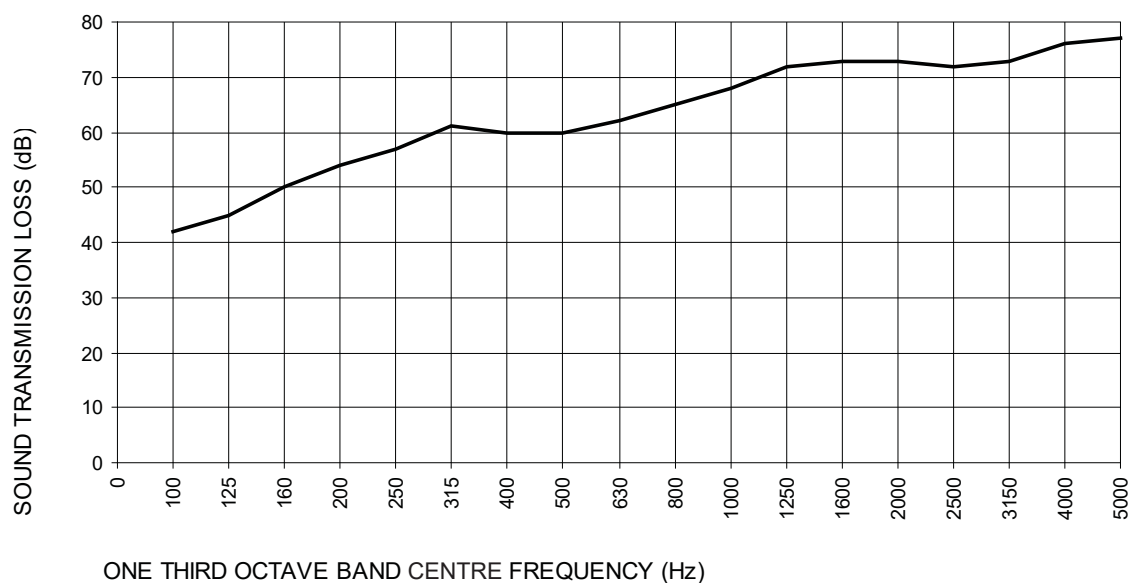
REPORT:

Test #9

AS-TL2660

Performance Data

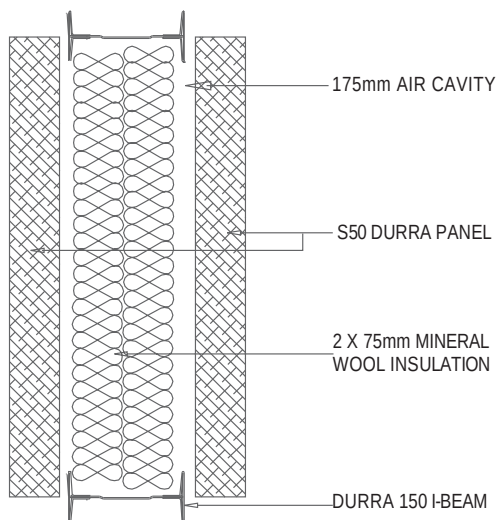
FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	42	45	50	54	57	61	60	60	62	65	68	72	73	73	72	73	76	77



Sound Transmission Loss - STC 64

Durra Wall Semi Disconnected System: Double S50 Durra Panel Plain

Product Details



REFERENCE: **ST - 26**

TESTED:

Durra Panel: Double S50 Plain

Wall Girt: Durra 150 I-Beam

Air Cavity: 175mm

Insulation: 2 x 75mm Mineral Wool

Not Shown: Wing isolation clips attached from Durra 150 I-Beam to S50 Durra Panel

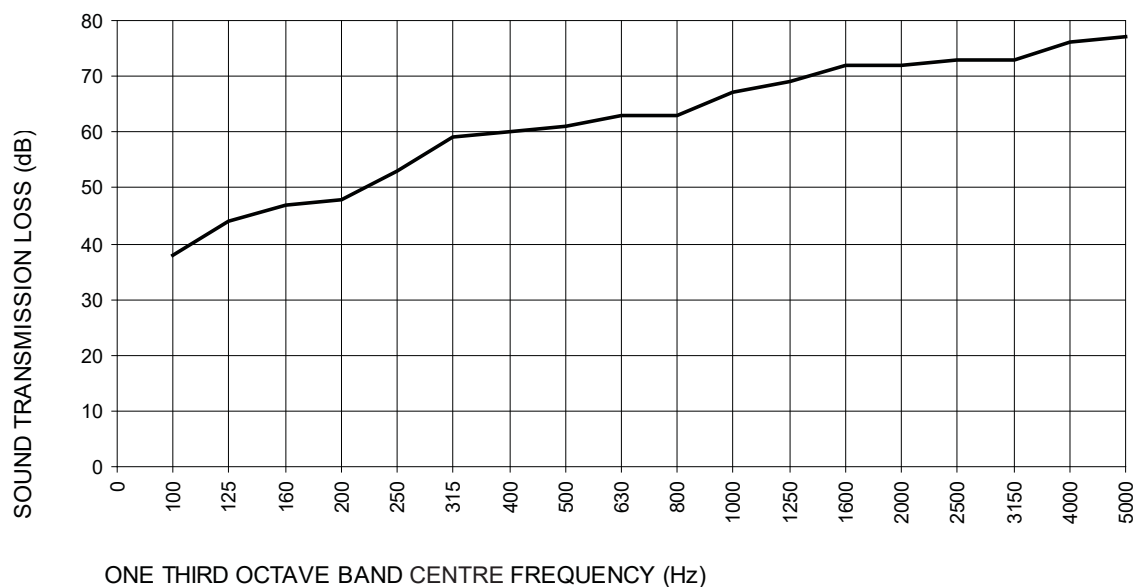
REPORT:

Test #12

AS-TL2662

Performance Data

FREQUENCY (Hz)	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.1K	4K	5K
TRANSMISSION LOSS (dB)	38	44	47	48	53	59	60	61	63	63	67	69	72	72	73	73	76	77



Section 8

Typical Details

Connection Details..... 8.1.1

Sections Details 8.2.1

Graded Purlins Details 8.3.1

Box Gutter 8.4.1

Overhangs..... 8.5.1

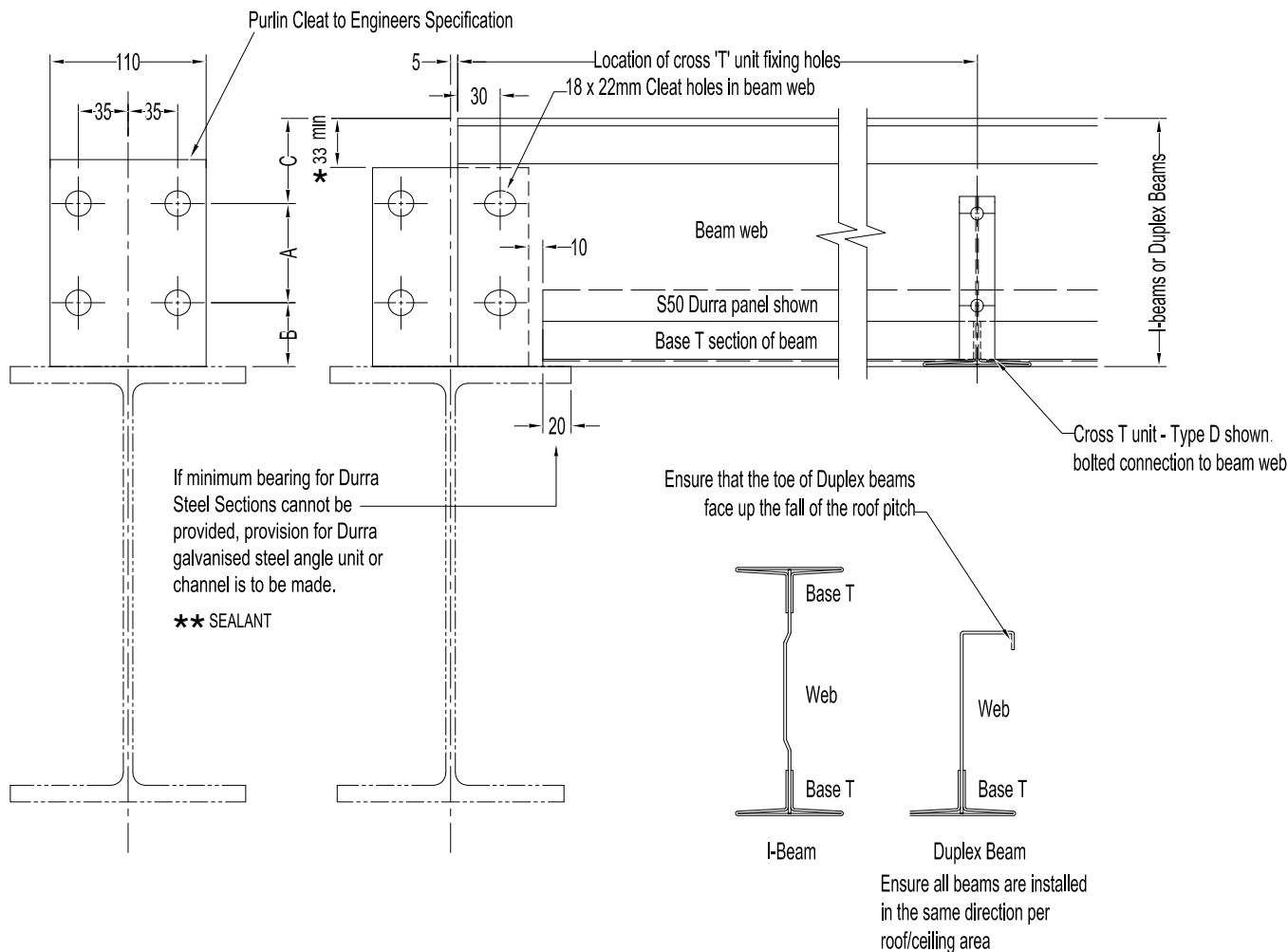
Skylights Details..... 8.6.1

Penetration Details 8.7.1

NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Connection Details

Standard Cleat Connection



Duplex Beams				
Beam Type	Dimensional Information			
	Nominal height (mm)	A	B	C
80	87	-	-	-
125	132	35	45	52
150	149	70	45	34
175	183	70	45	68
200	200	110	45	45
250	250	110	65	75

NOTE 1: DIMENSIONAL TOLERANCE IS + OR - 1mm

NOTE 2: DURRA I BEAMS AND DUPLEX BEAMS ARE TYPICALLY PLACED ON THE HIGH SIDE OF PURLIN CLEATS

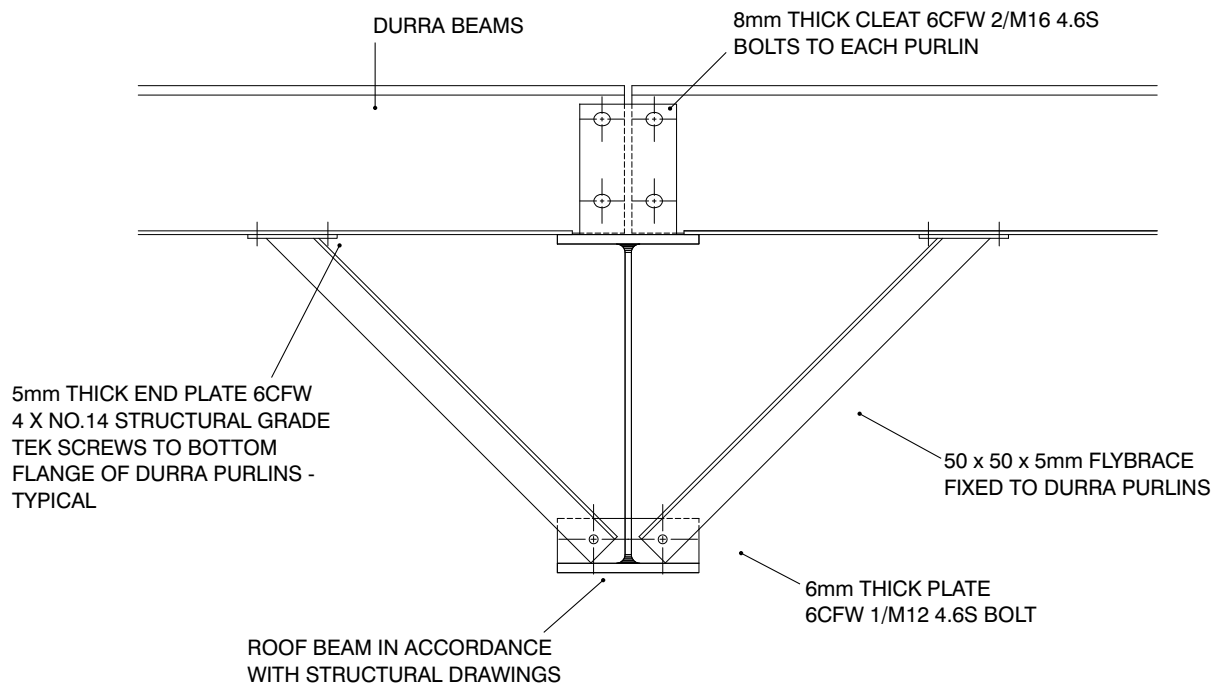
I Beams				
Beam Type	Dimensional Information			
	Nominal height (mm)	A	B	C
175	174	70	45	59
200	204	80	45	79
225	224	110	45	69
250	254	110	65	79
300	300	170	65	65
350	350	220	65	65
400	400	2 x 110	65	115

** DENOTES MINIMUM DIMENSION FOR I BEAMS ONLY

** SEALANT: FOR ACOUSTIC INSTALLATIONS IT IS RECOMMENDED TO CONSIDER APPLICATION OF A CONTINUOUS BEAD OF CLASS F 25LM SILICONE OR POLYURETHENE SEALANT TO CAULK ANY GAPS BETWEEN DURRA PANEL AND STRUCTURAL STEELWORK. IF IN DOUBT CONSULT THE PROJECT ACOUSTIC ENGINEER

Connection Details

Typical Flybrace Connection



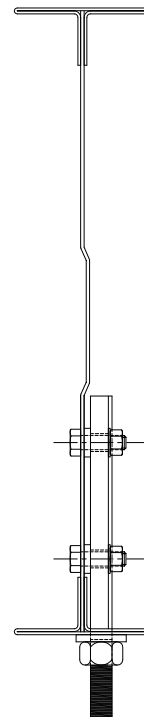
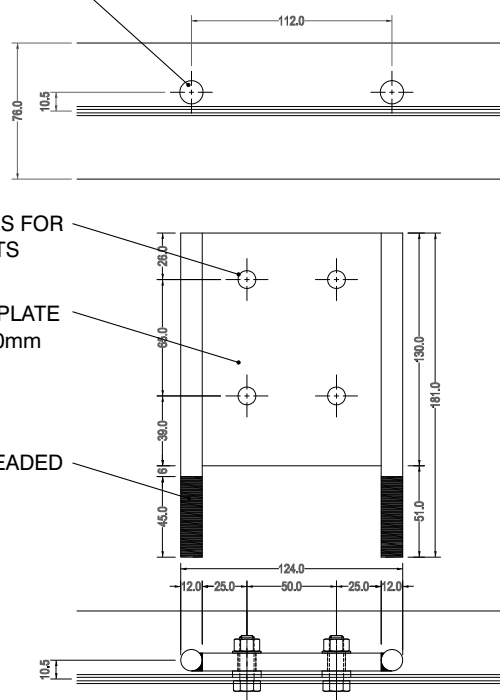
Highload Flybrace Connection

DRILL 2 OFF 130mm HOLES TO SUIT 12mm THREADED ROD

4 x 10mmØ HOLES FOR 4NO. 8mmØ BOLTS

10mm FLAT PLATE 100mm x 130mm

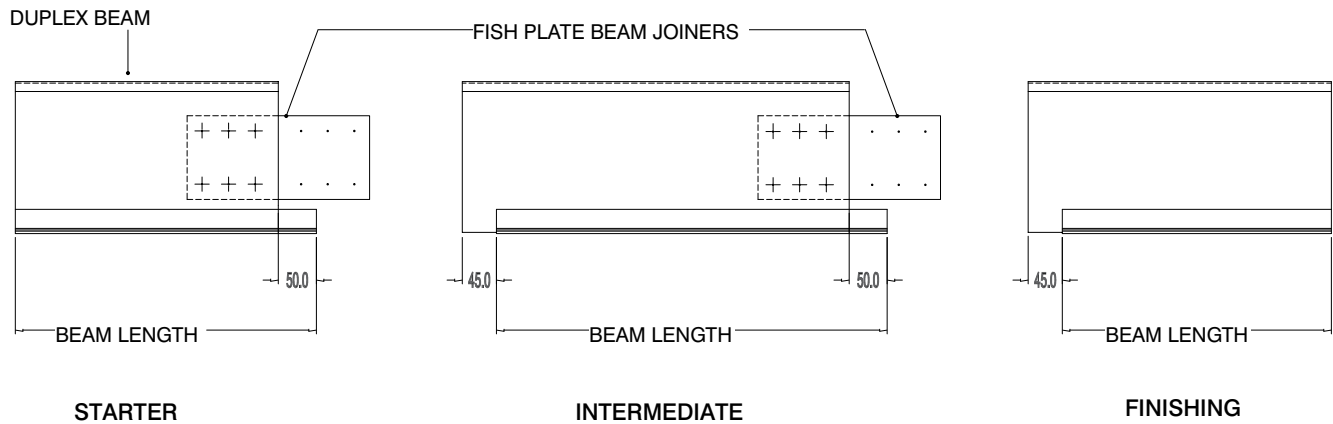
12mmØ THREADED ROD



Connection Details

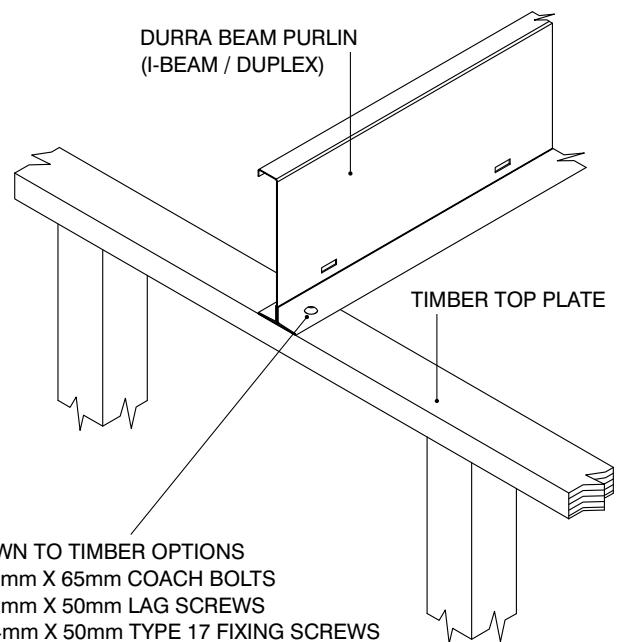
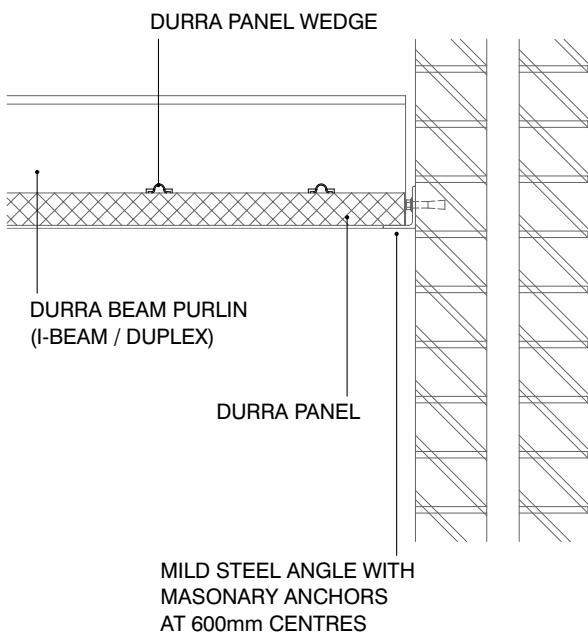
Durra Suspended Ceiling System

Duplex Beam Main Runner Connection



Durra Steel Section Fixed To Brick Work

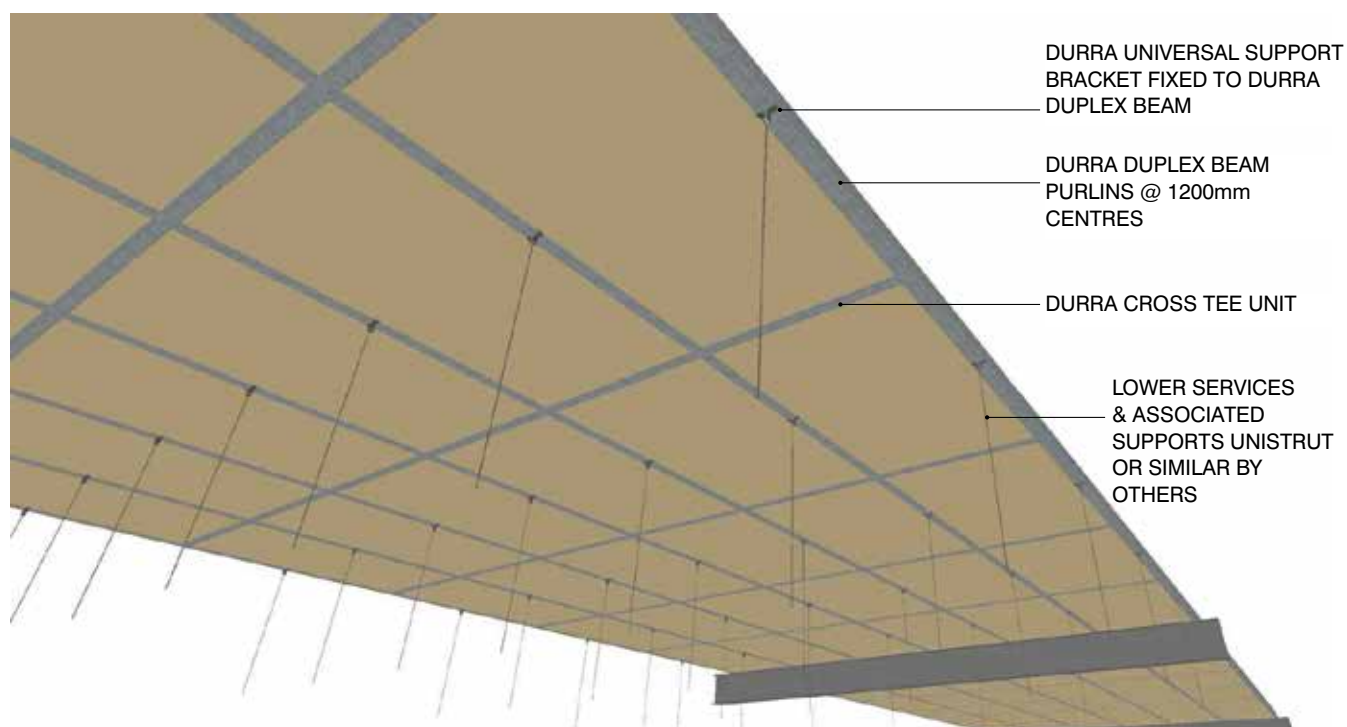
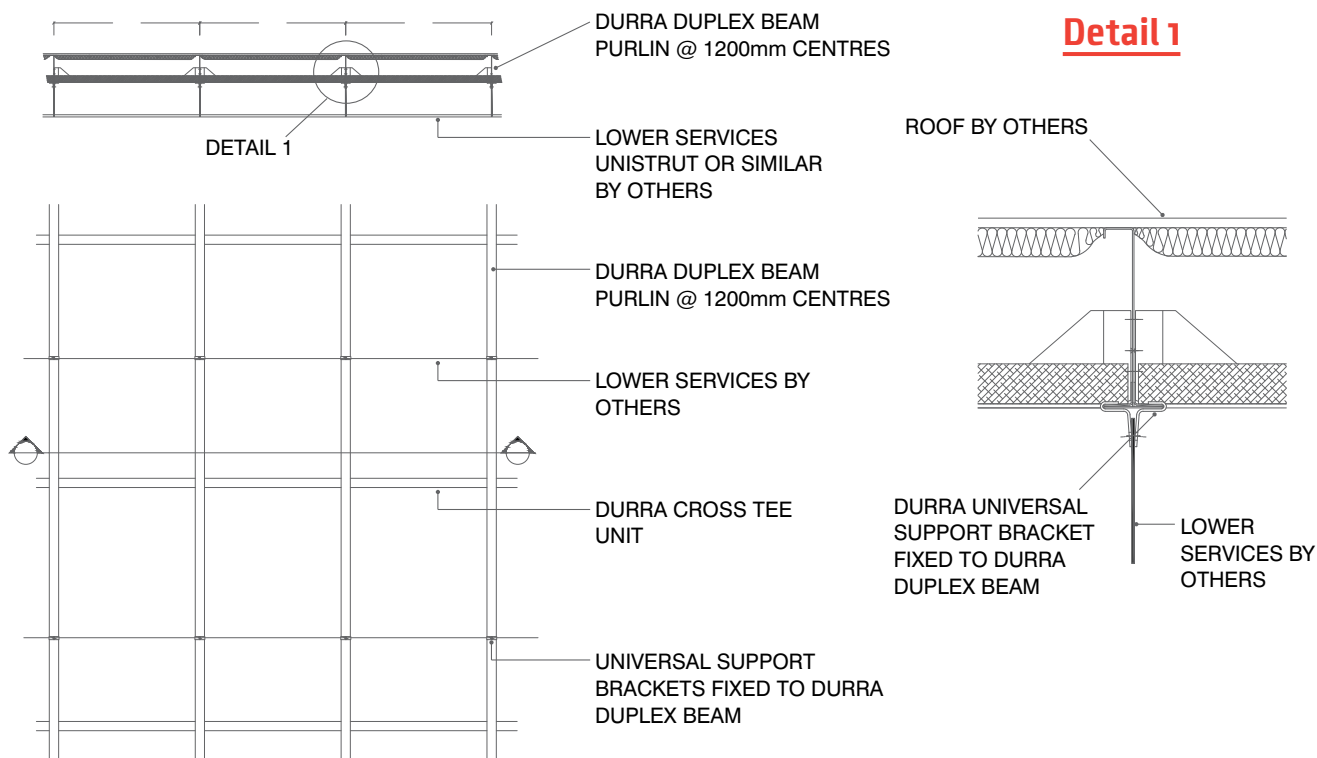
Durra Steel Section Fixed To Timber



STRUCTURAL ENGINEER TO CONFIRM WHICH
FIXING TYPE IS APPLICABLE TO PROJECT
SPECIFIC REQUIREMENTS

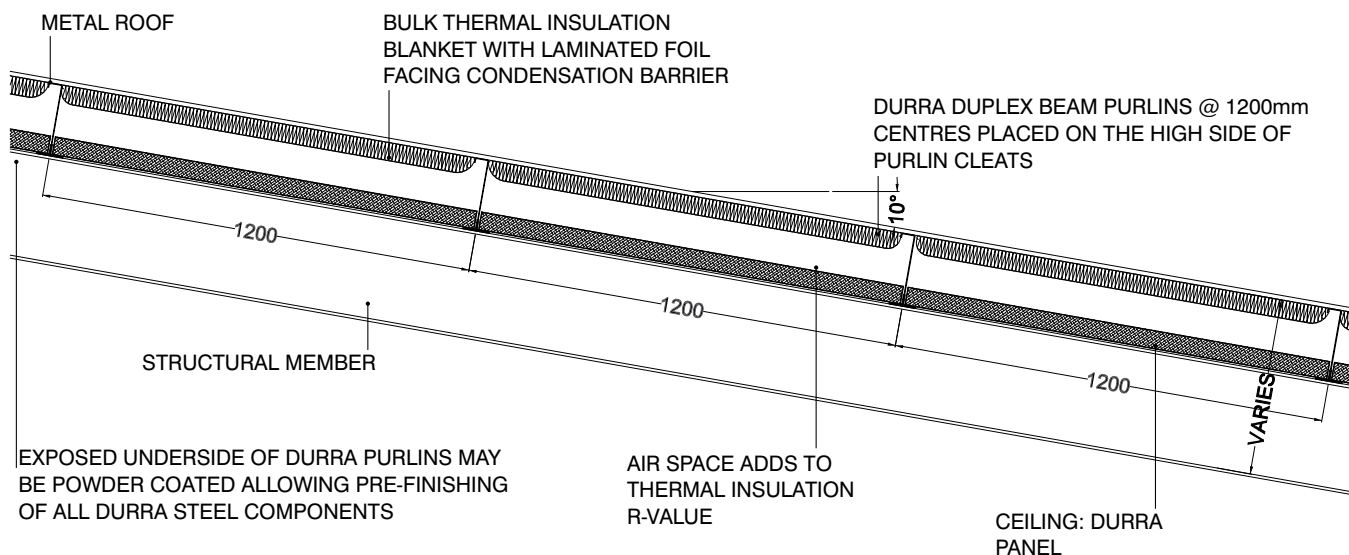
Connection Details

Supporting Services - Durra Universal Support Bracket - USB

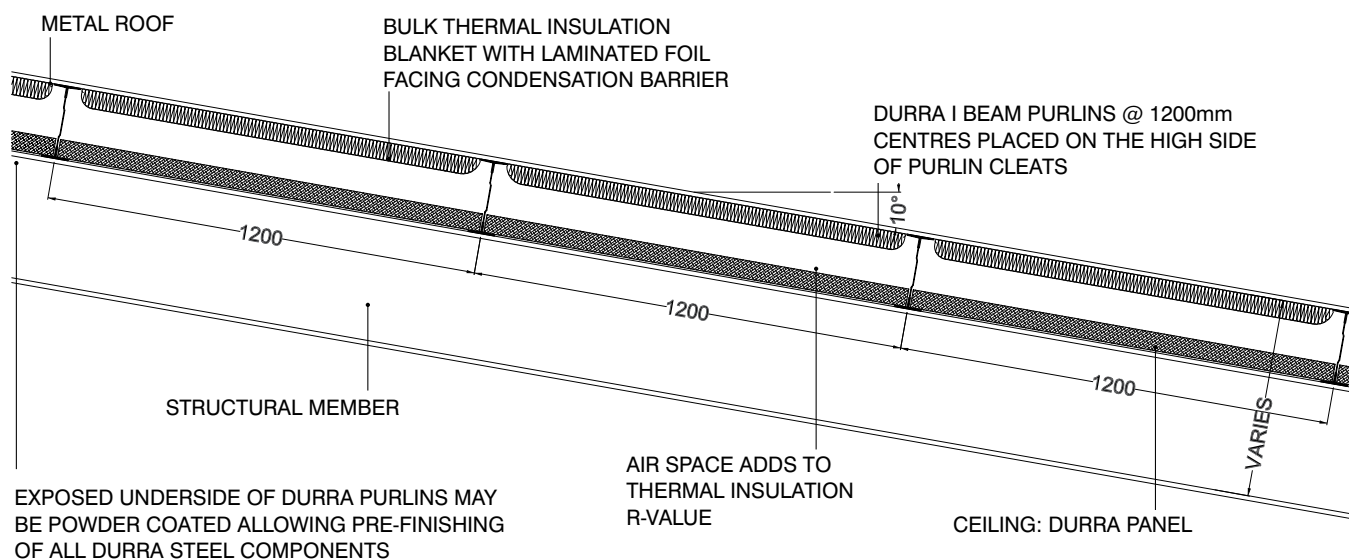


Section Details

Durra Duplex Beam Fixed Over Graded Structural Steel

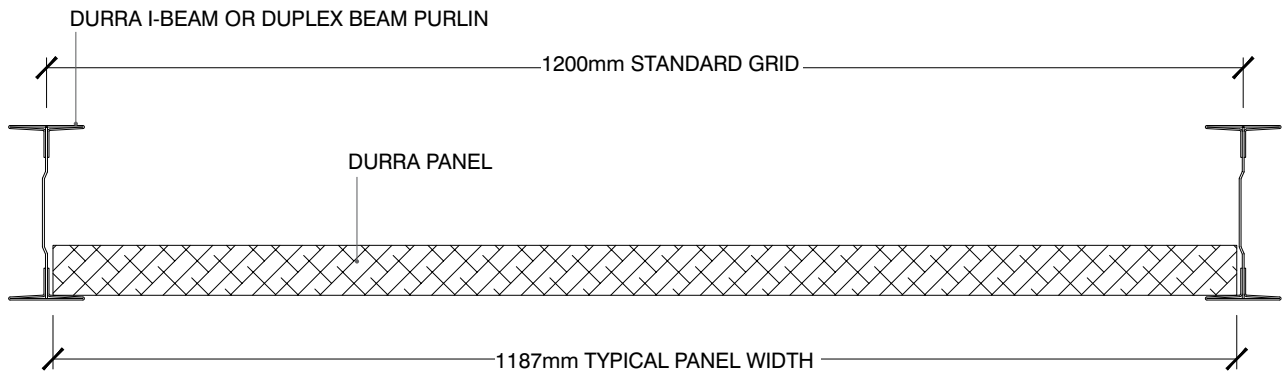


Durra I Beam Fixed Over Graded Structural Steel

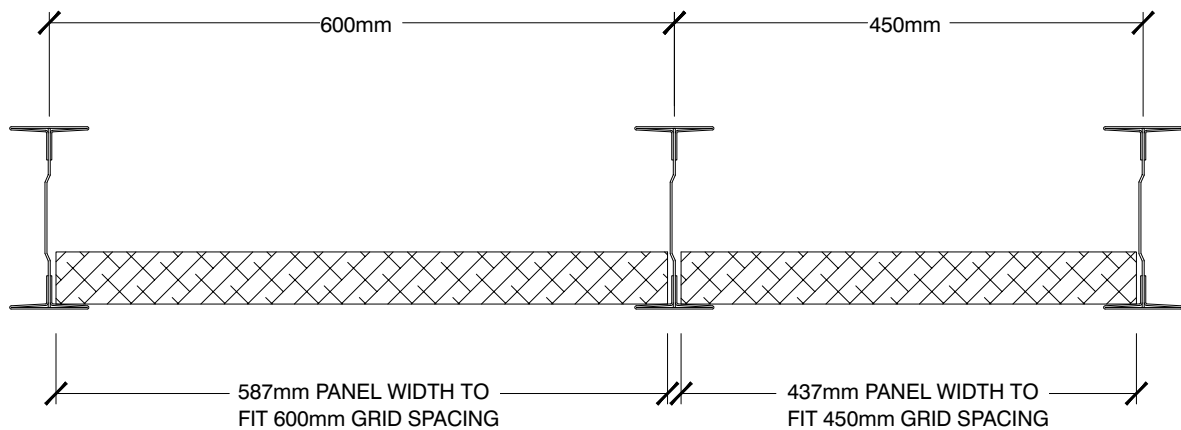


Section Details

Standard Grid

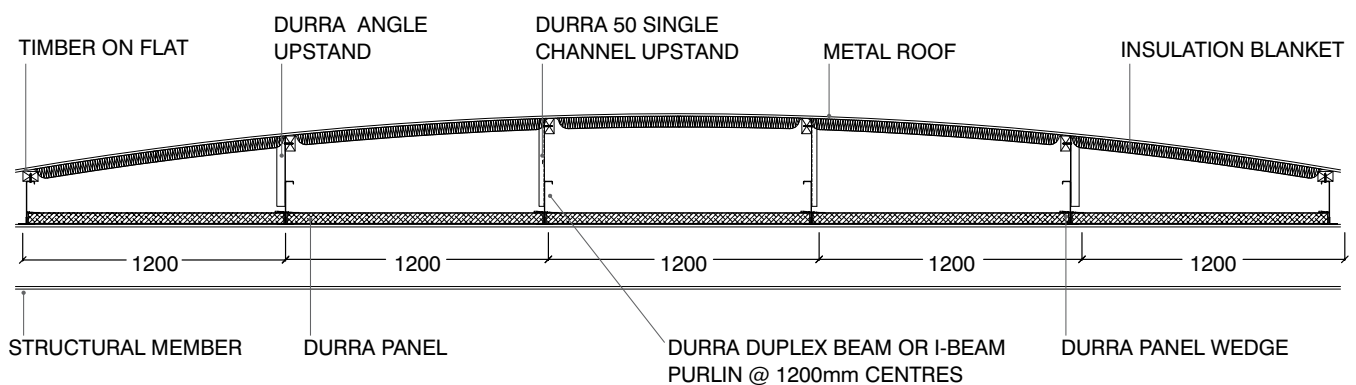


Non Standard Grid

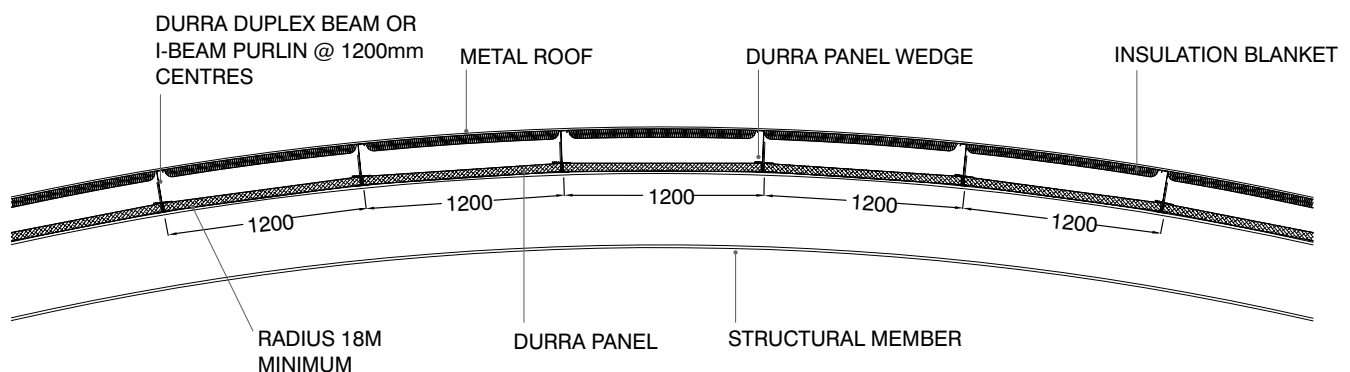


Section Details

Curved Roof Over Level Structural Steel Using Graded Battens



Curved Roof Over Graded Structural Steel



Typical Details

Section Details

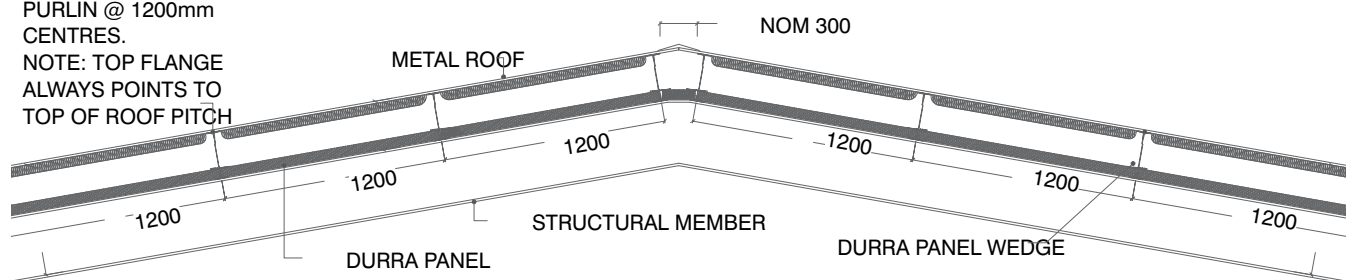
Gable Roof Over Graded Structural Steel

Durra Duplex Beam

DURRA DUPLEX BEAM

PURLIN @ 1200mm
CENTRES.

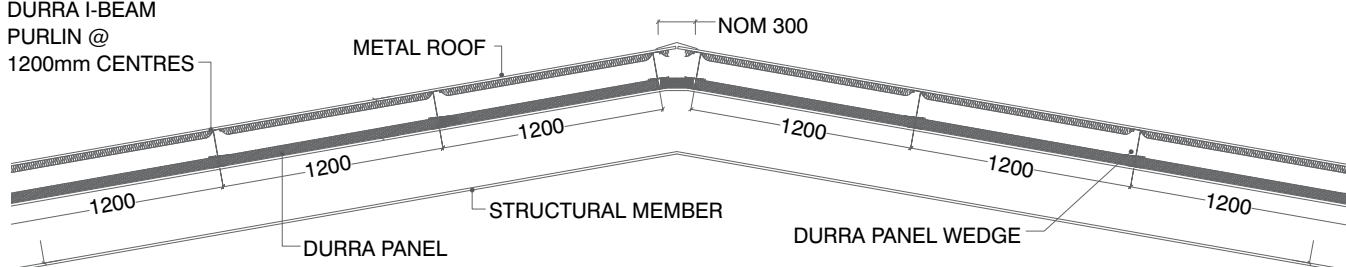
NOTE: TOP FLANGE
ALWAYS POINTS TO
TOP OF ROOF PITCH



Durra I Beam

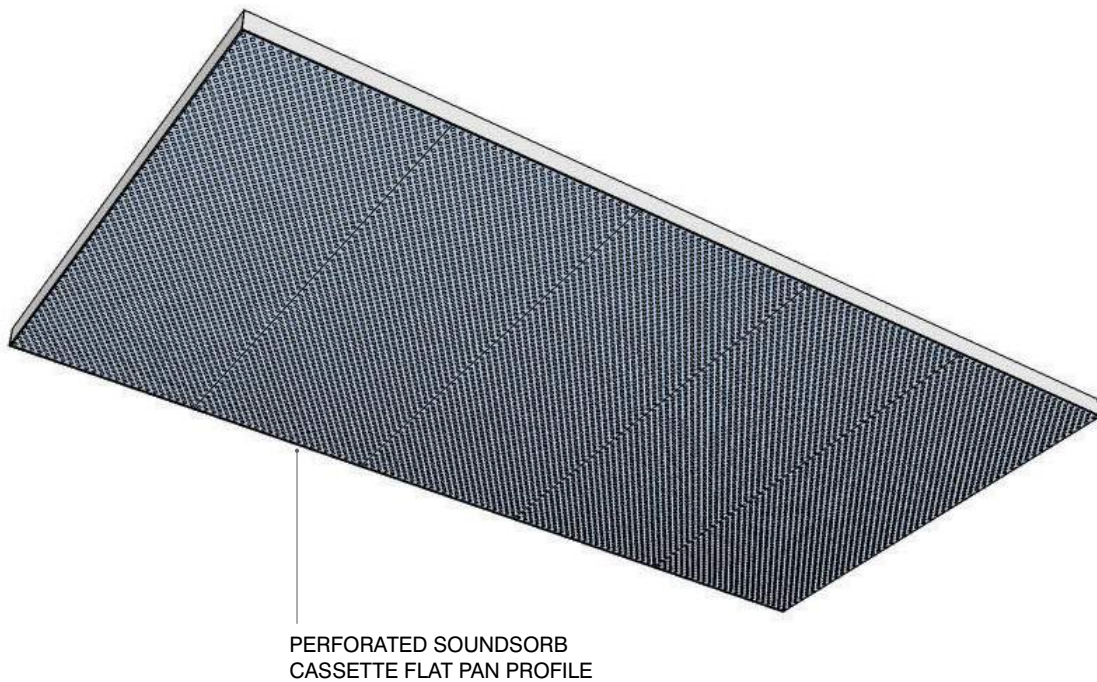
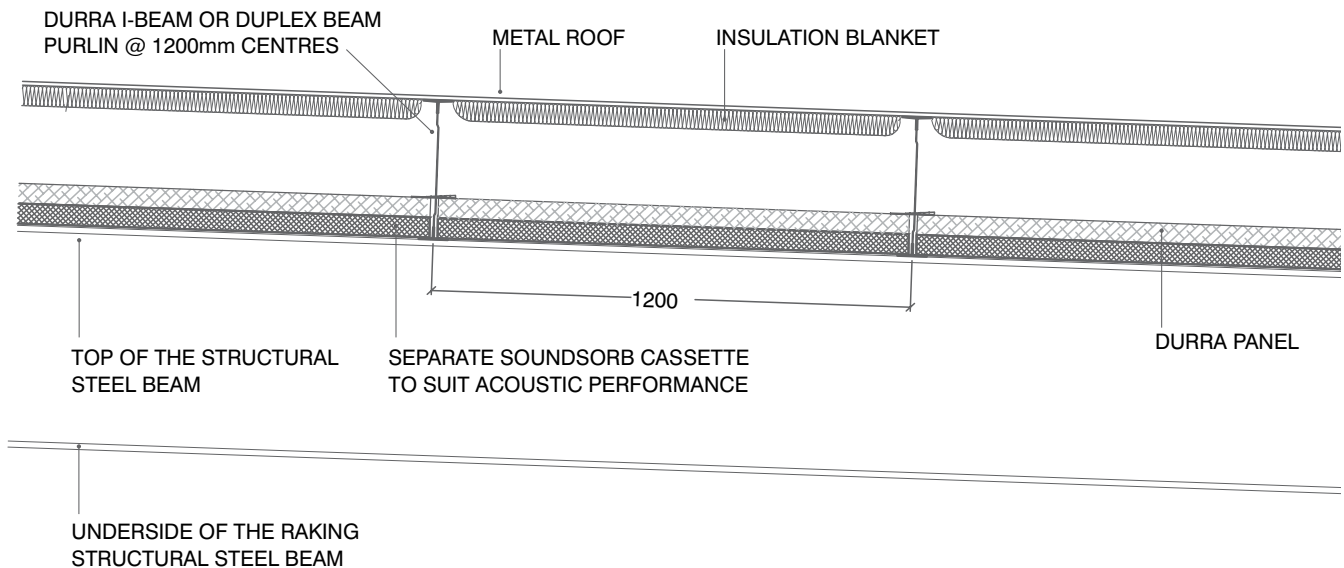
DURRA I-BEAM

PURLIN @
1200mm CENTRES



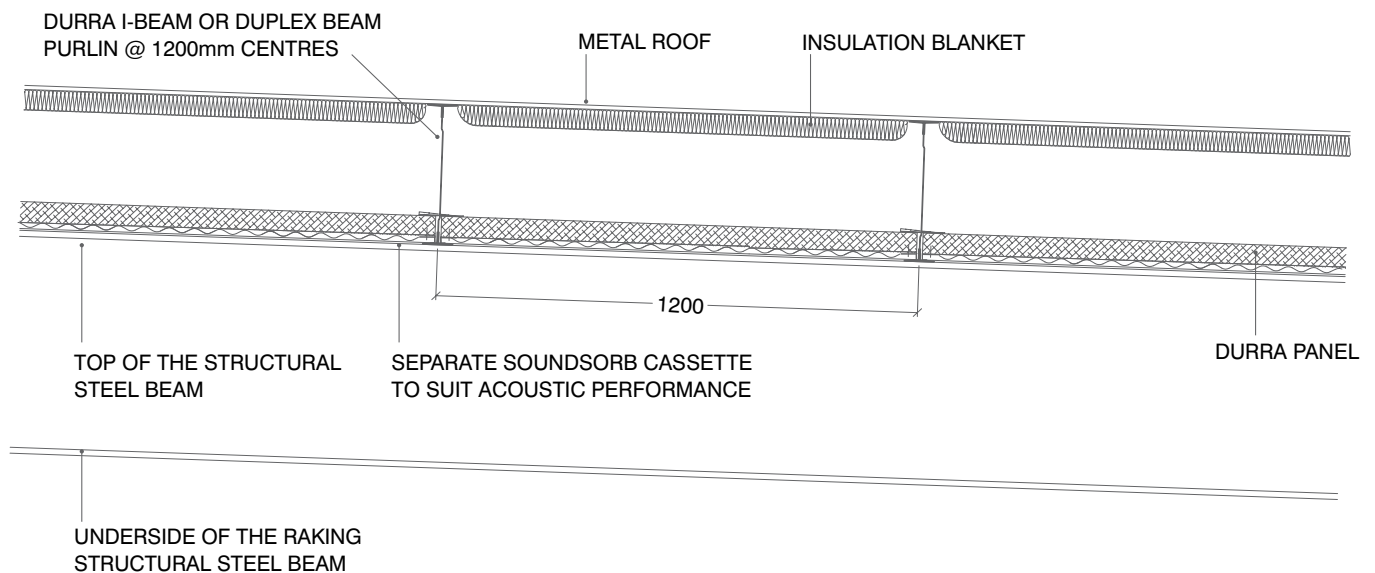
Section Details

Durra Roof/Ceiling System With Perforated Soundsorb Flat Pan Profile Cassette



Section Details

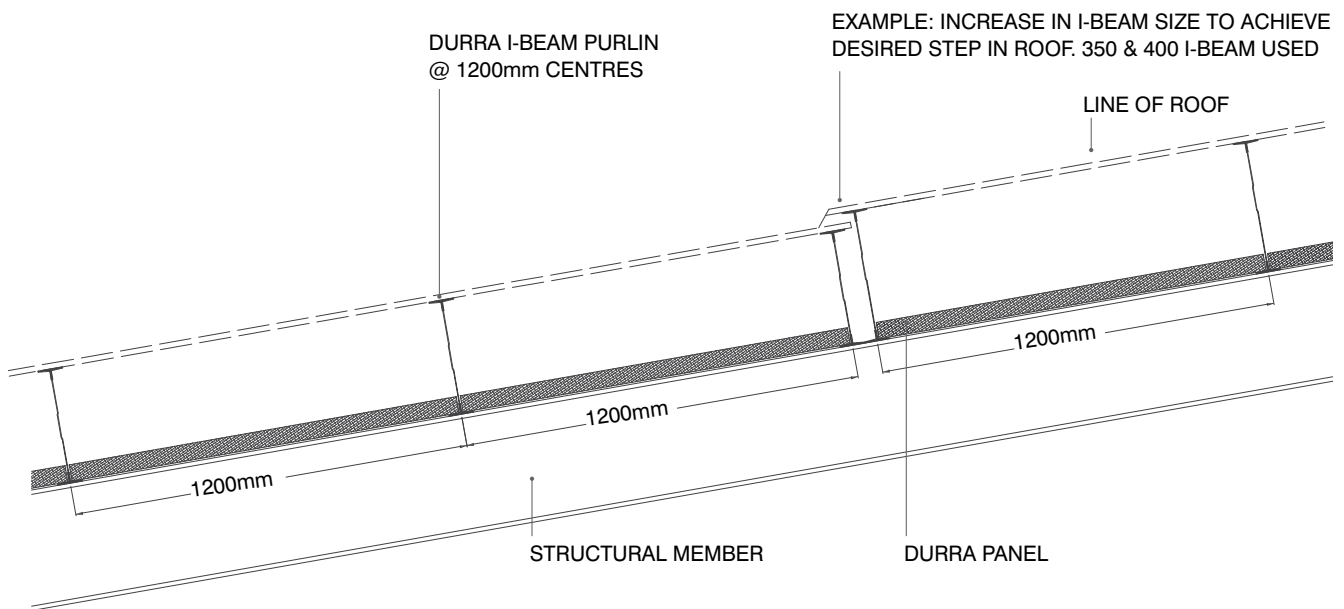
Durra Roof/Ceiling System With Perforated Soundsorb Corrugated Profile Cassette



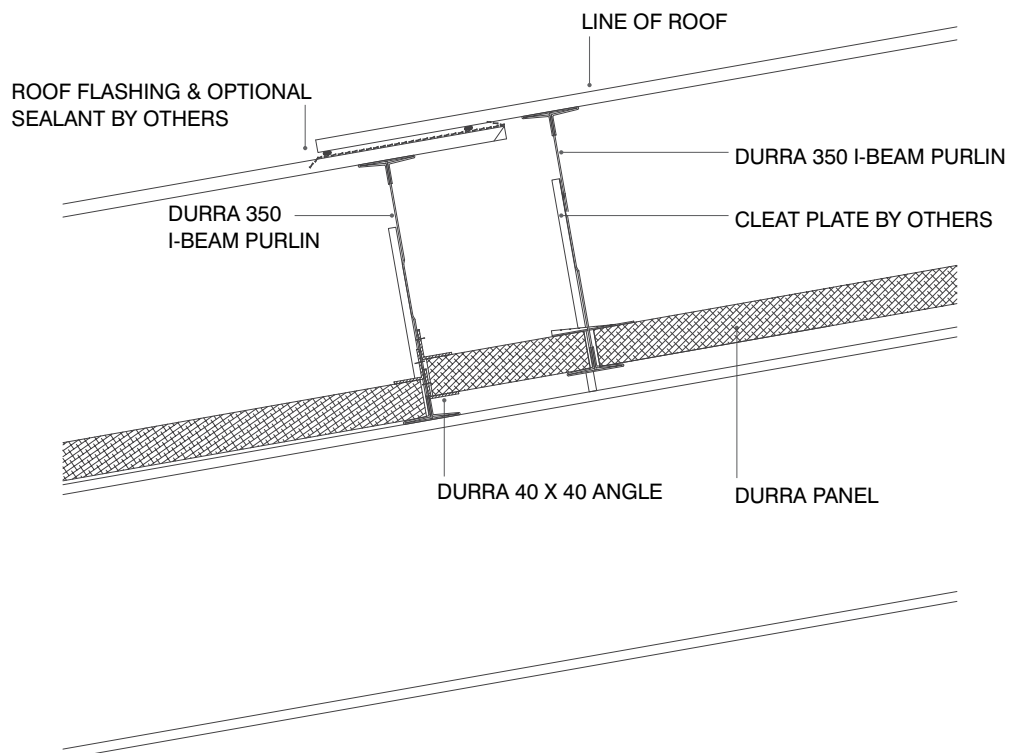
PERFORATED SOUNDSORB
CASSETTE CORRUGATED PROFILE

Section Details

Expansion Joint A



Expansion Joint B

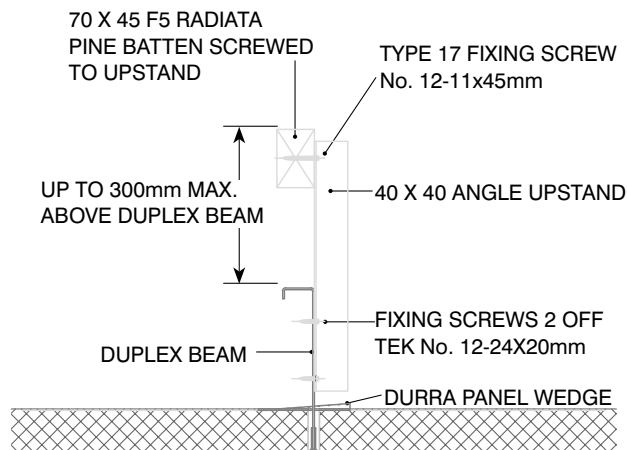


NOTE: Durra Steel Sections are placed on the high side of purlin cleats

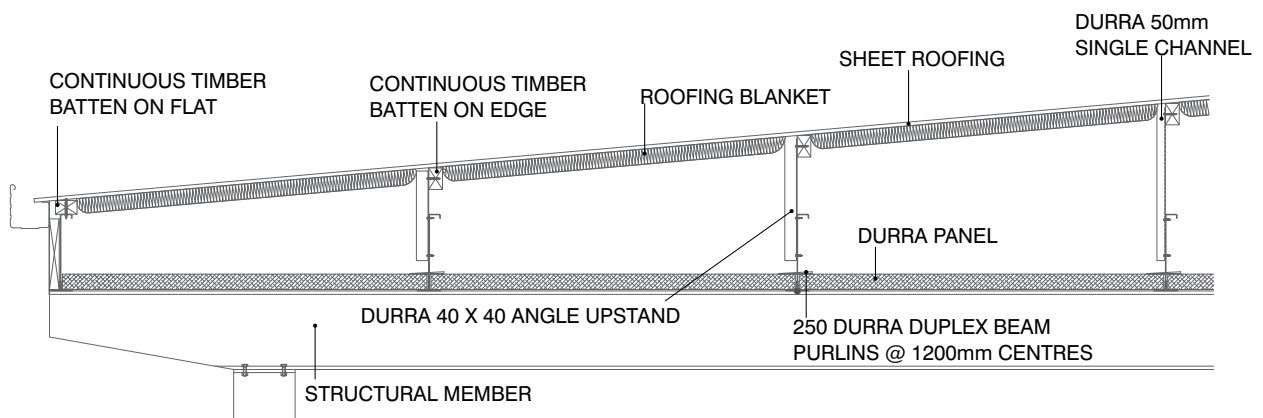
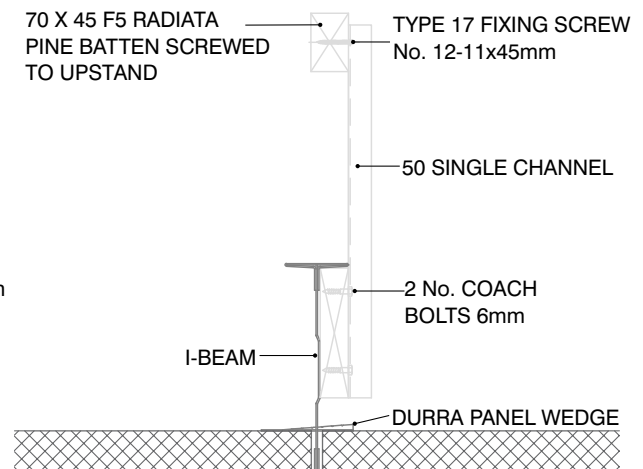
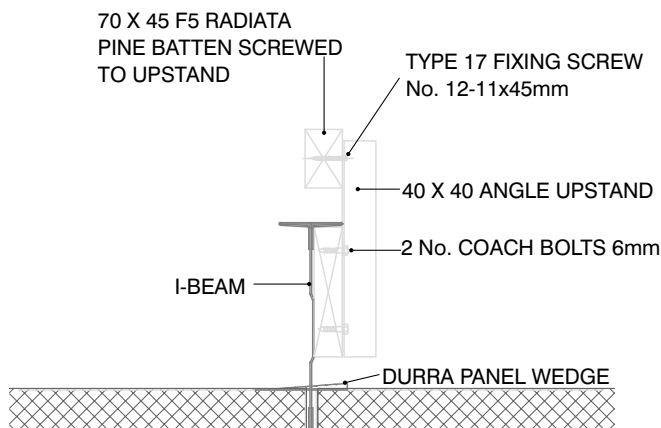
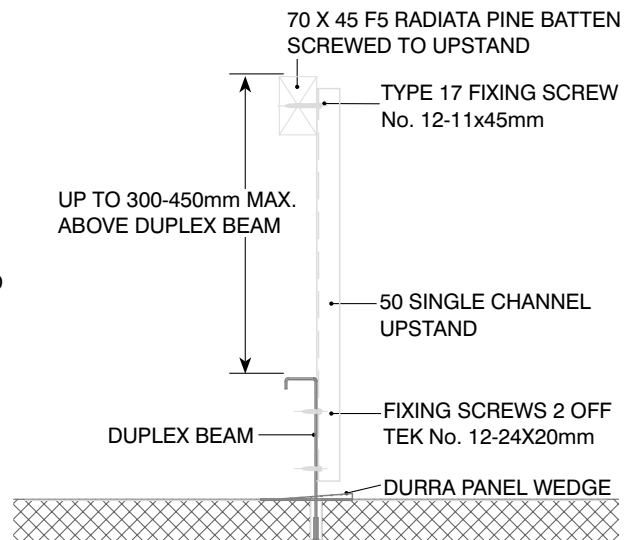
Graded Purlin Details

Uprand Detail - Graded Purlins

Durra Angle

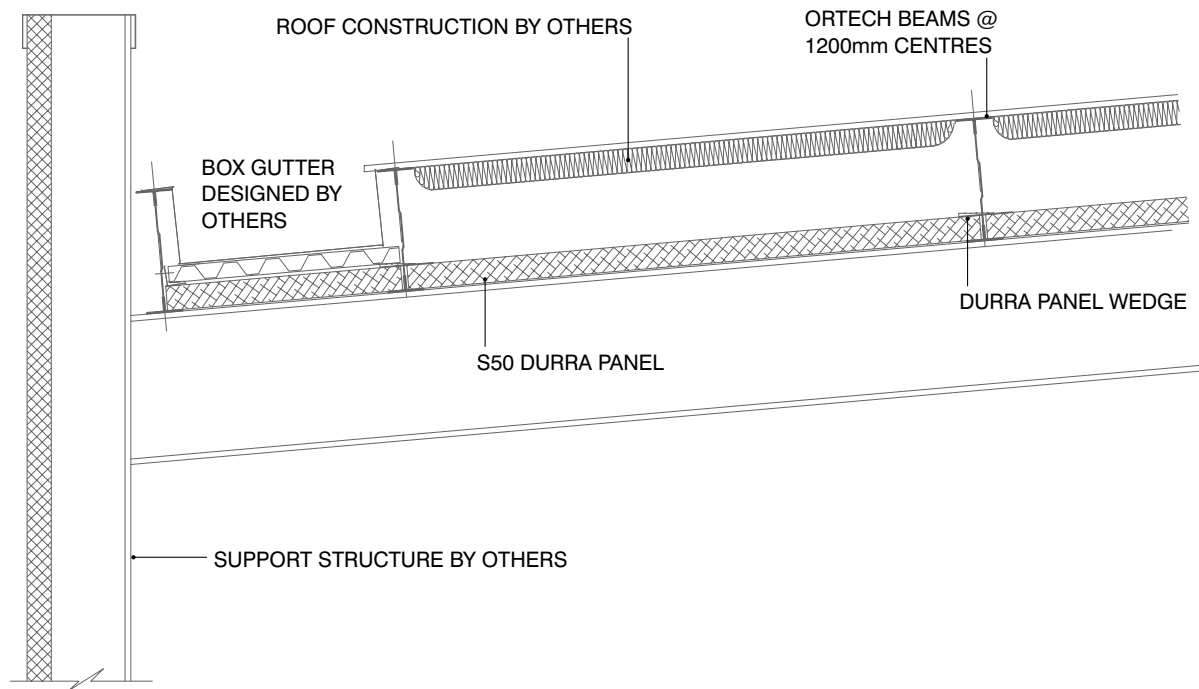


Durra Channel

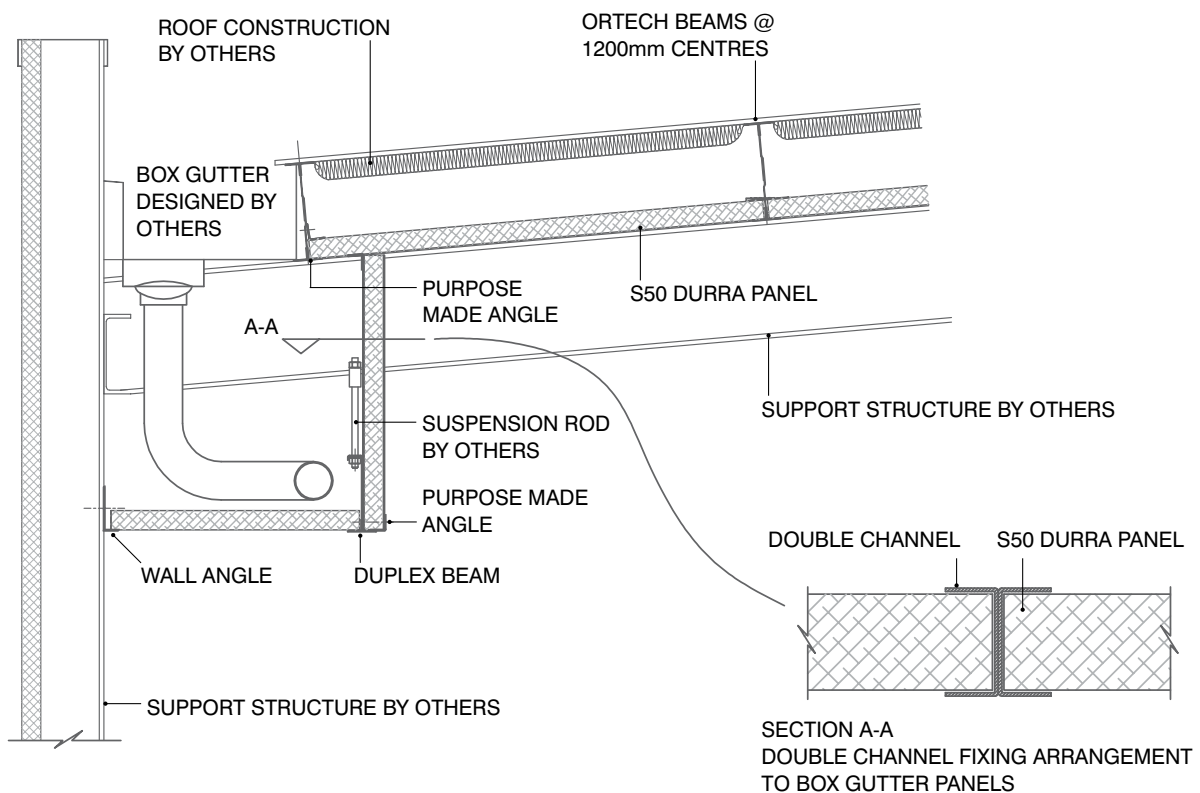


Box Gutter

Box Gutter

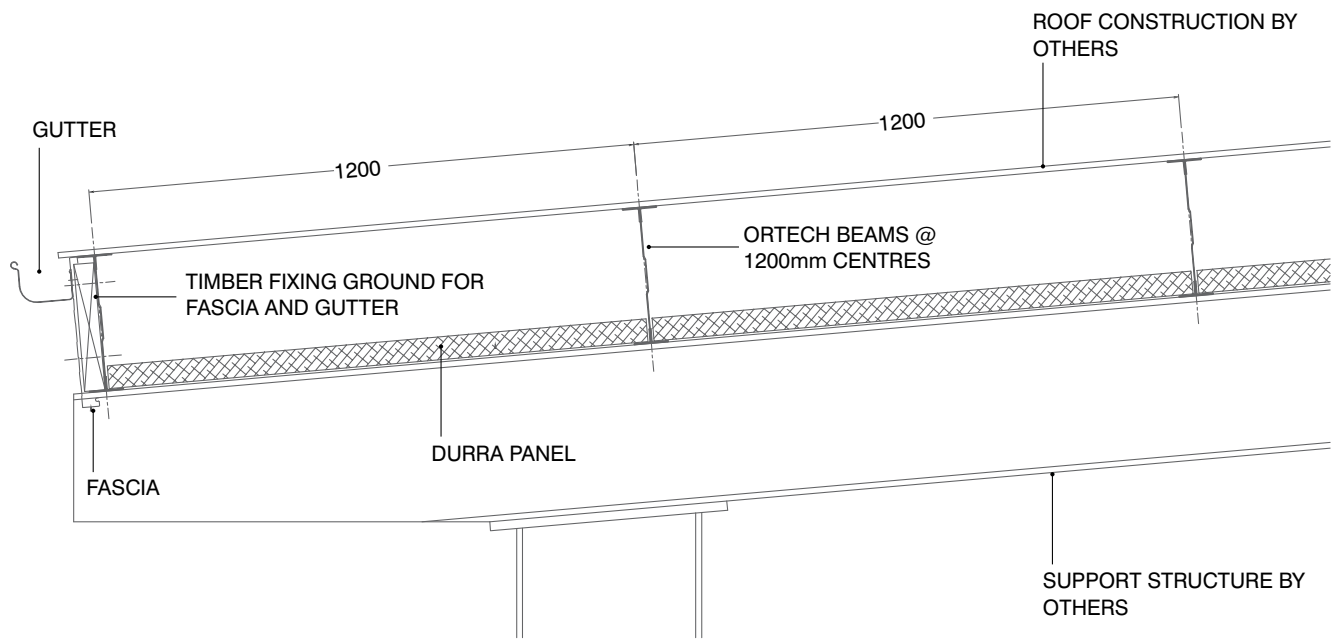


Box Gutter Bulk Head

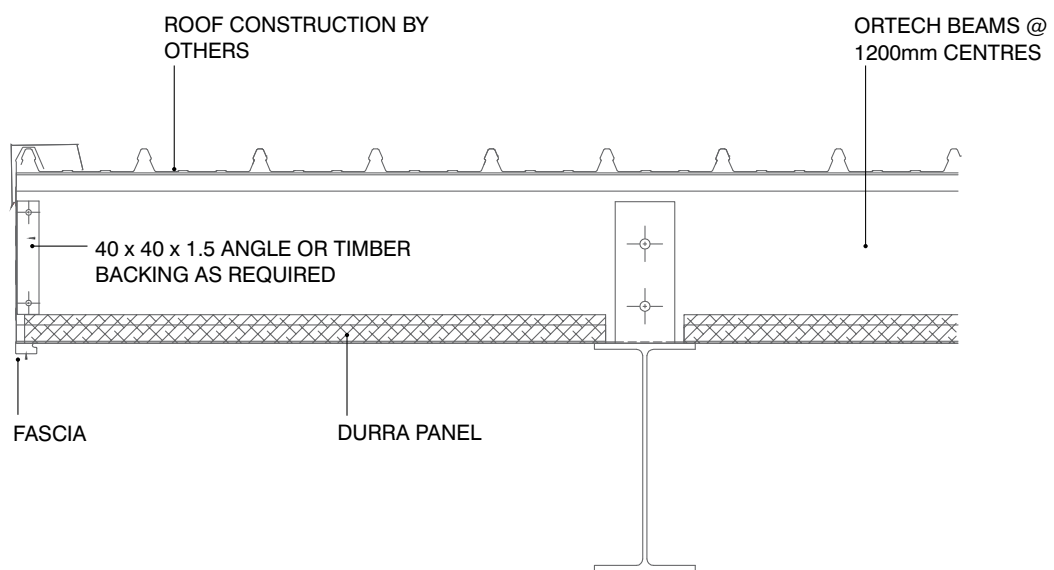


Overhangs

Eaves

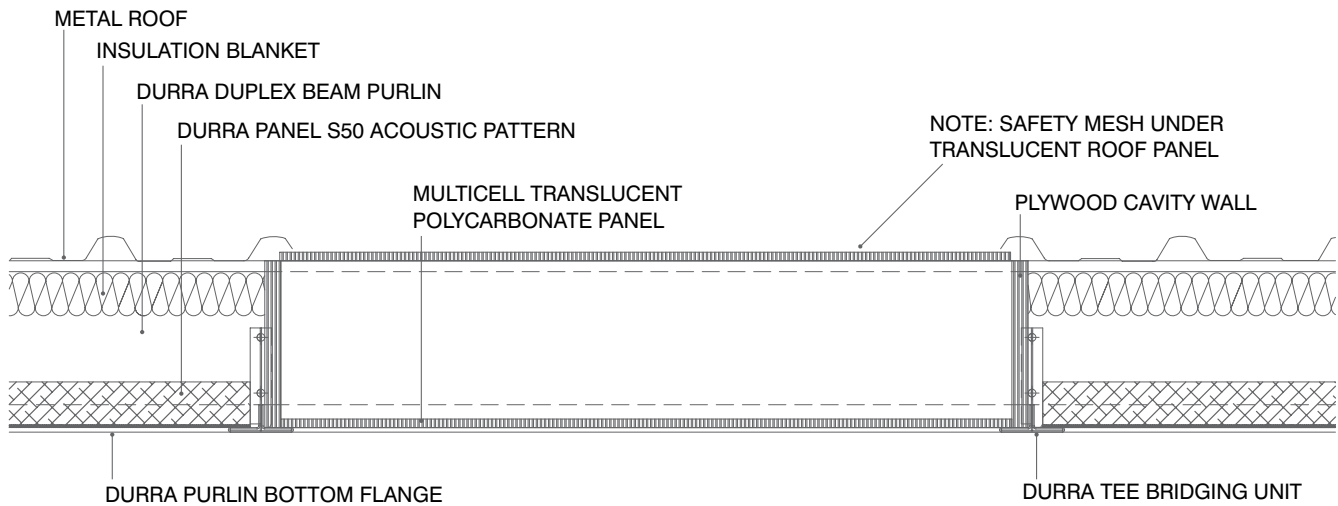


Verge

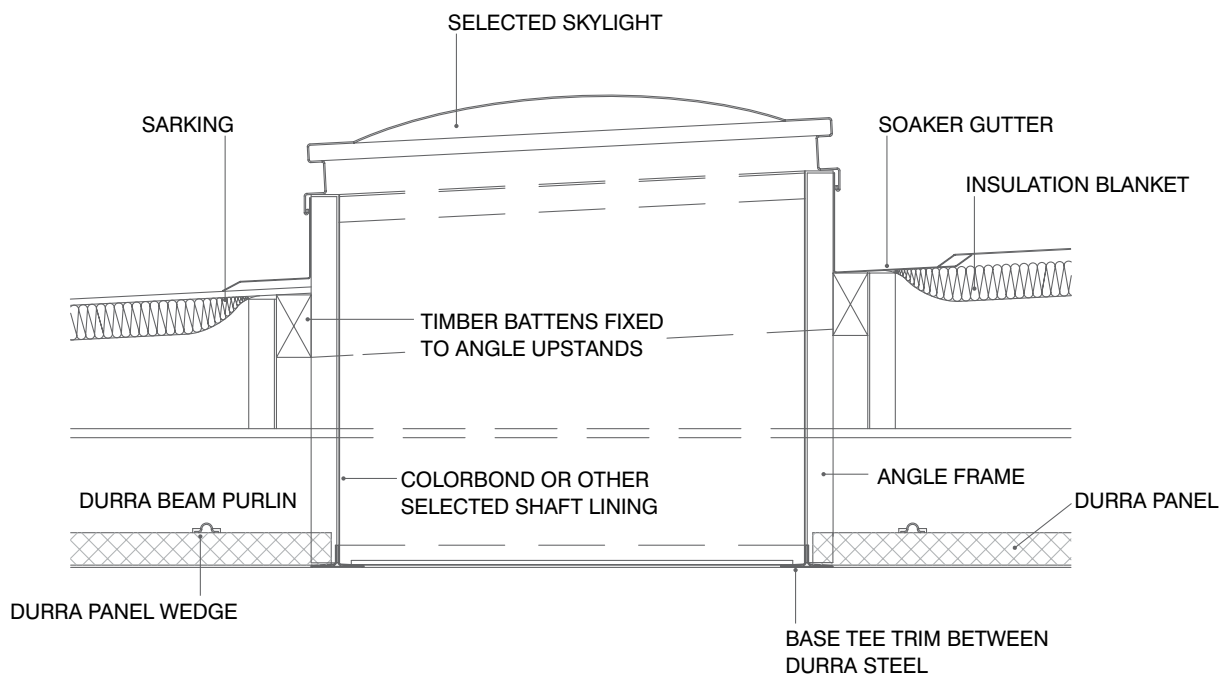


Skylight Details

Roof Light



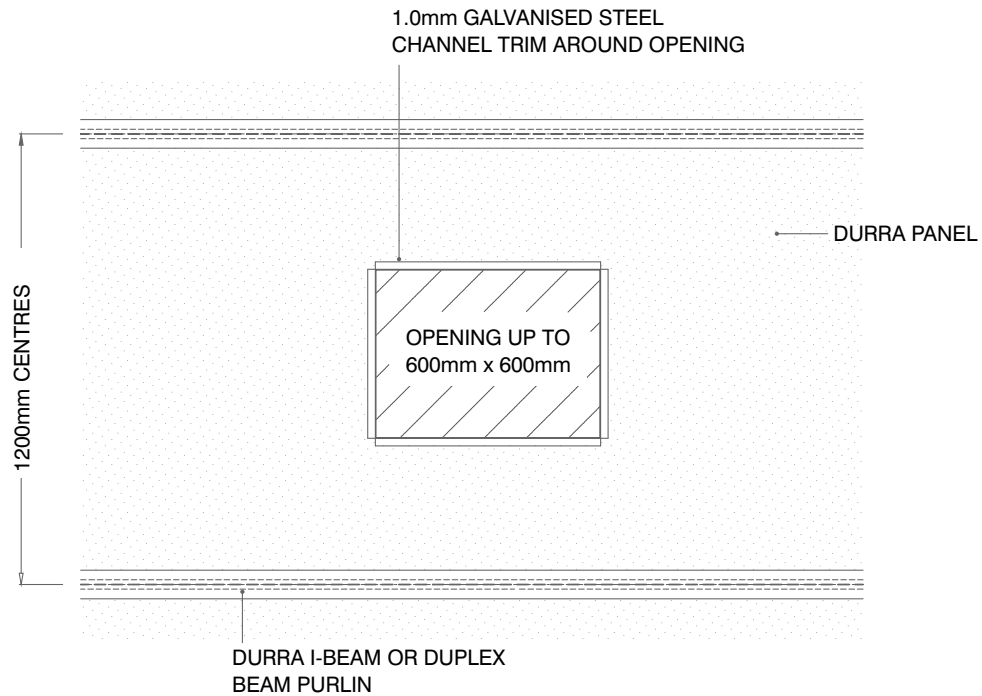
Dome Light



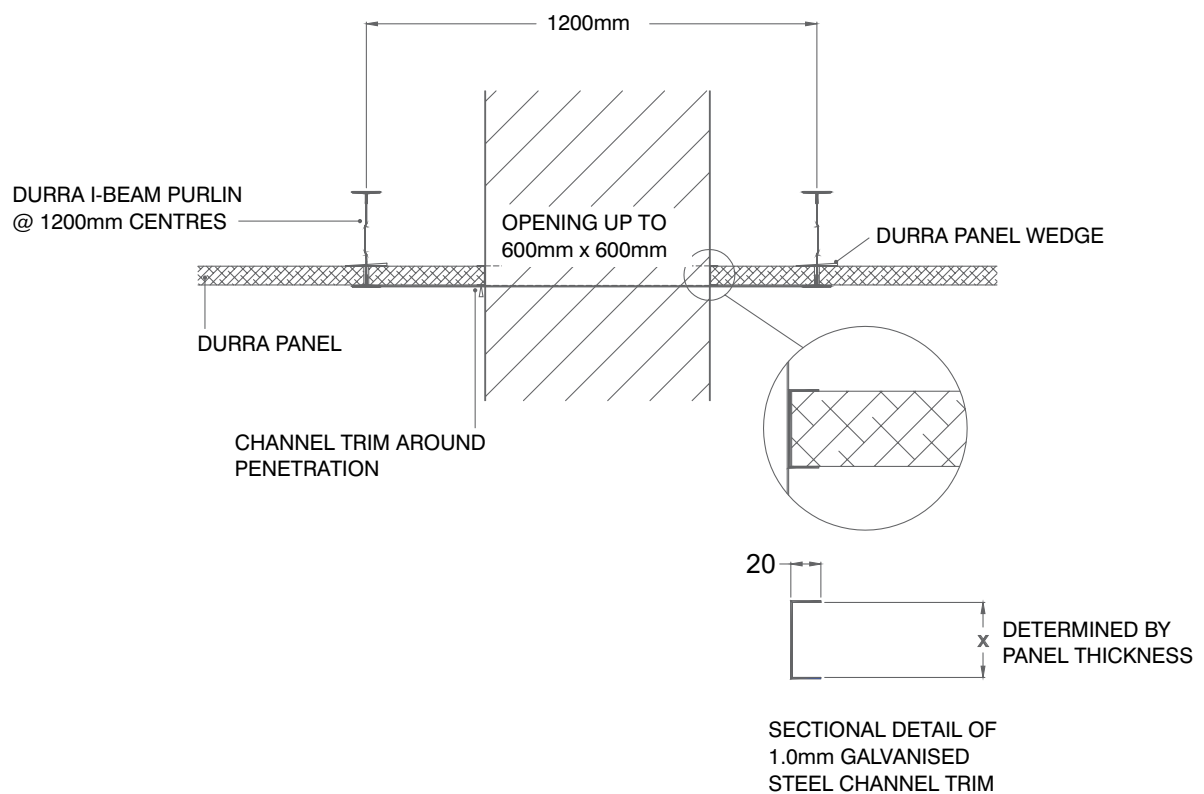
Penetration Details

Penetration Up To 600mm X 600mm

Plan



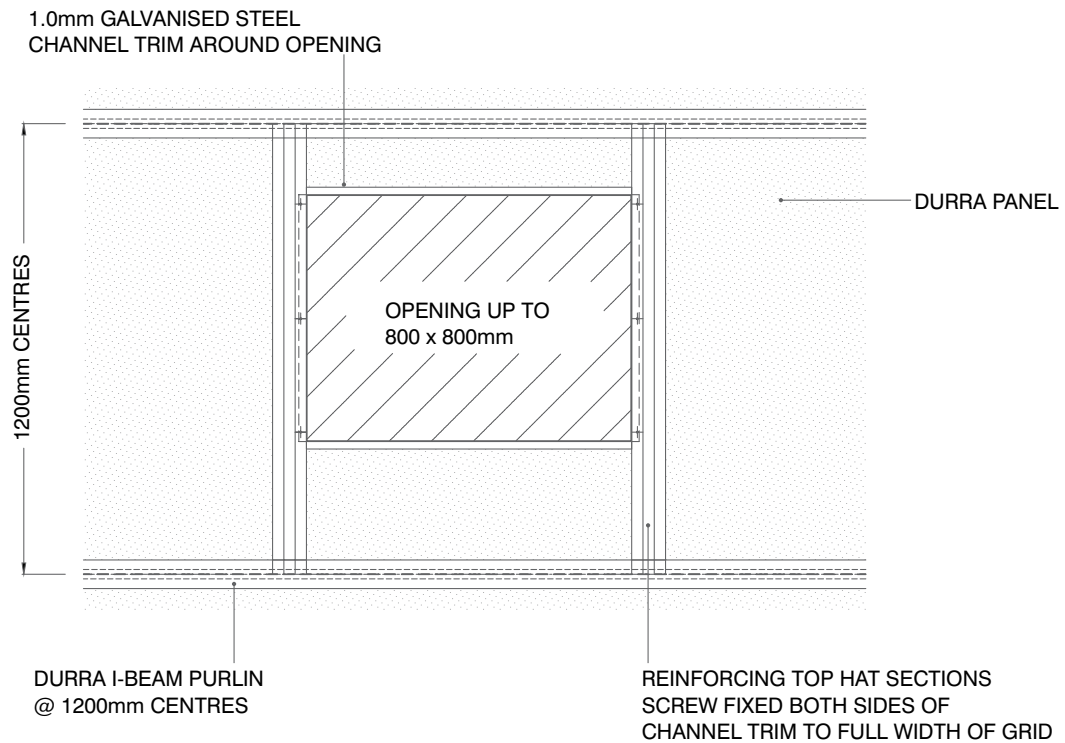
Section



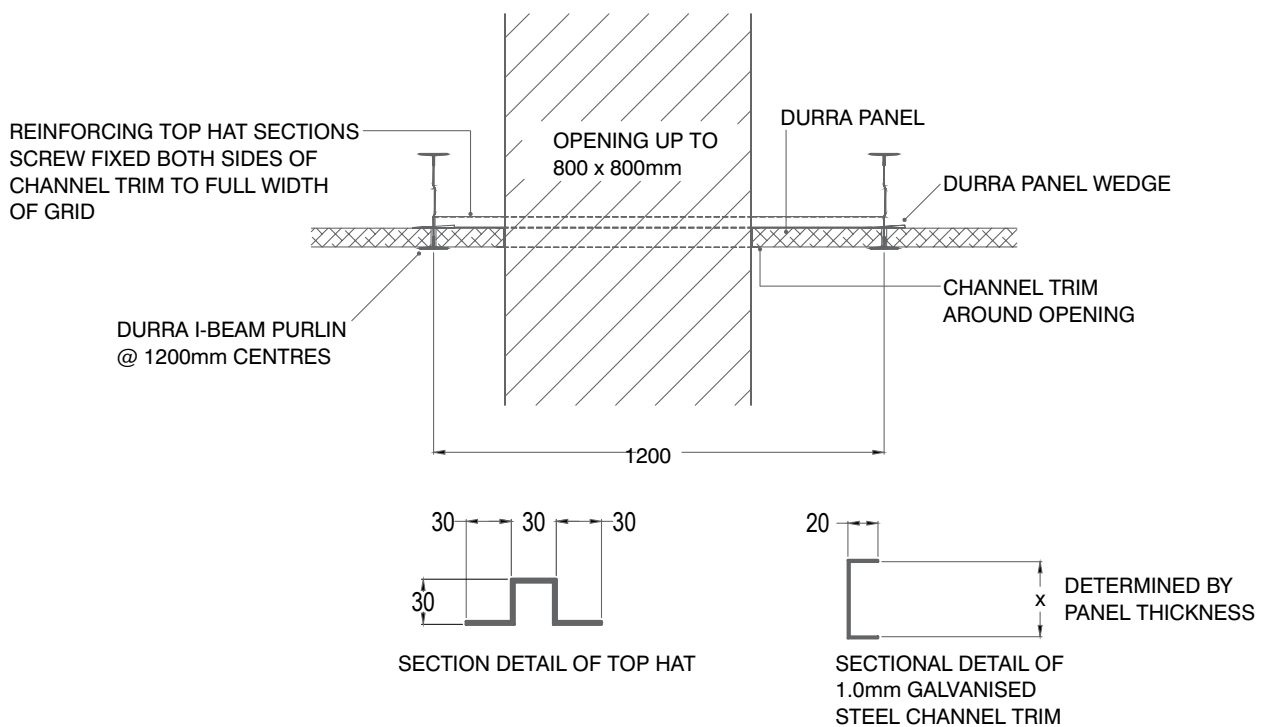
Penetration Details

Penetration Up To 800mm X 800mm

Plan



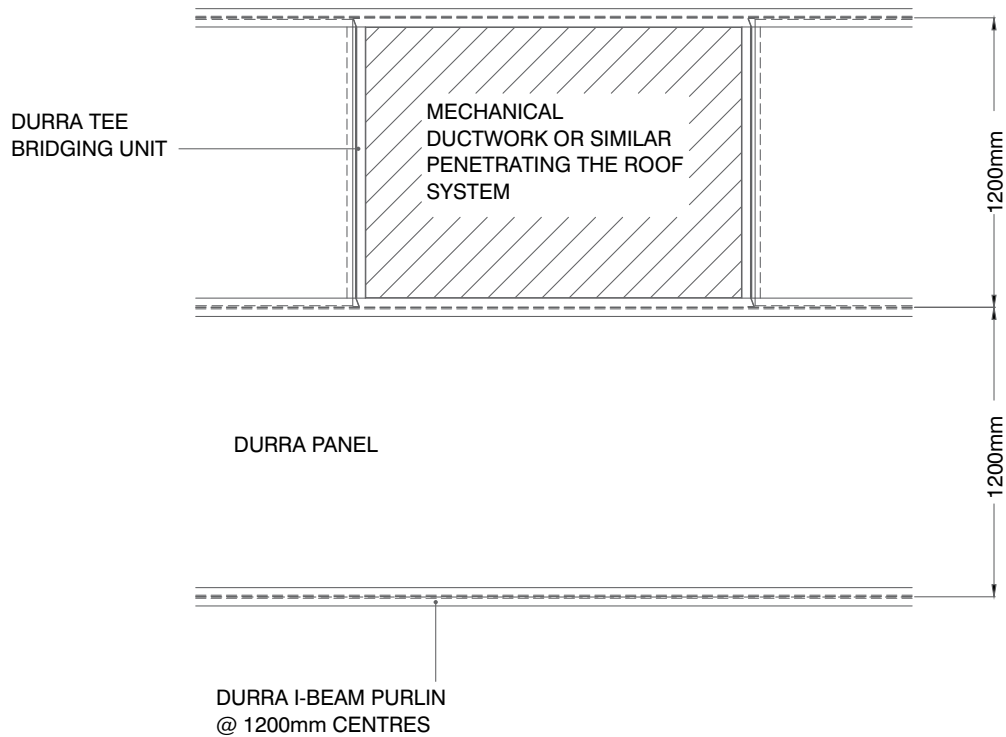
Section



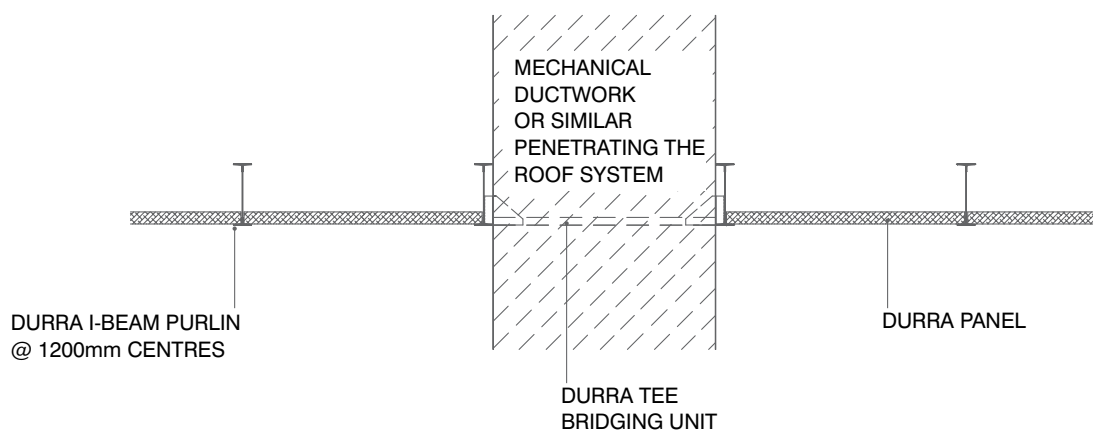
Penetration Details

Penetration Full Width Of Ceiling Grid

Plan



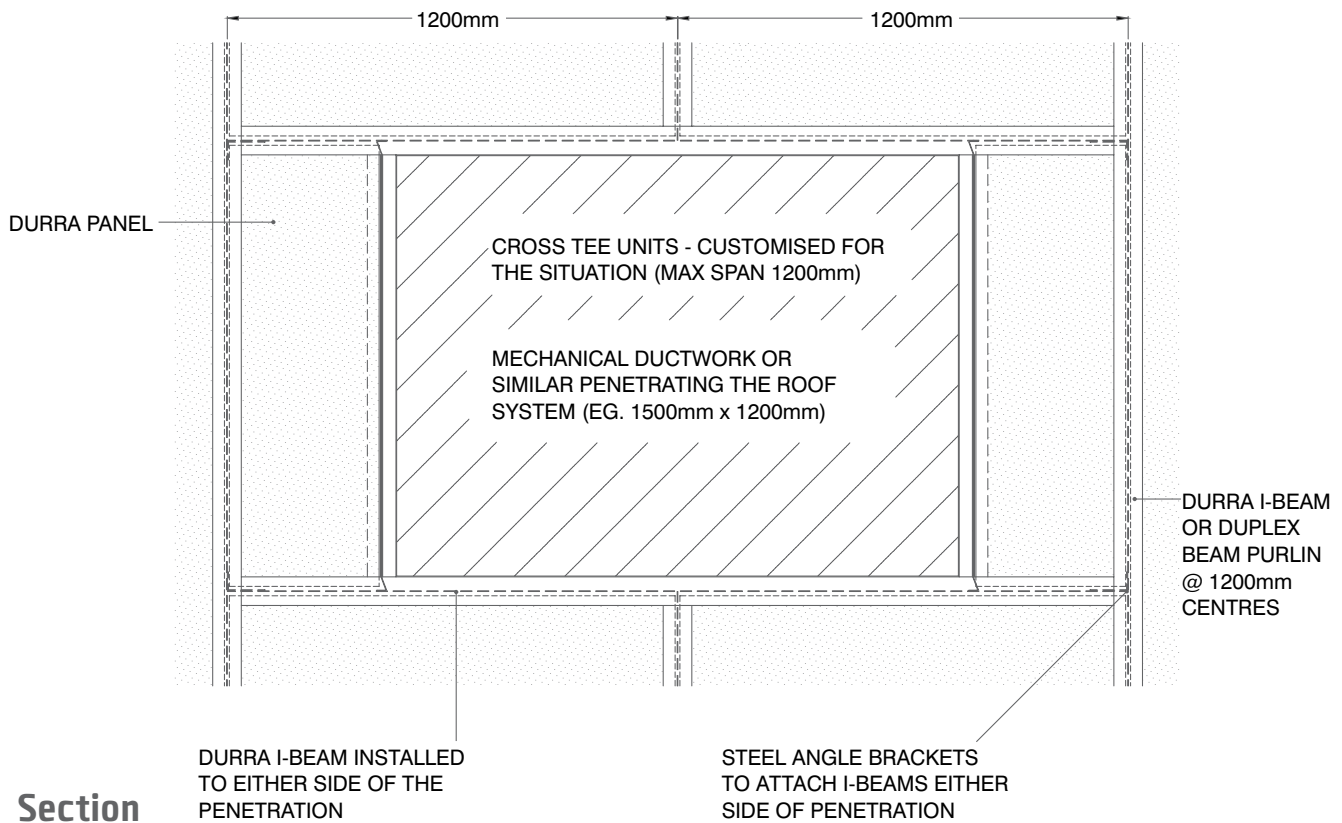
Section



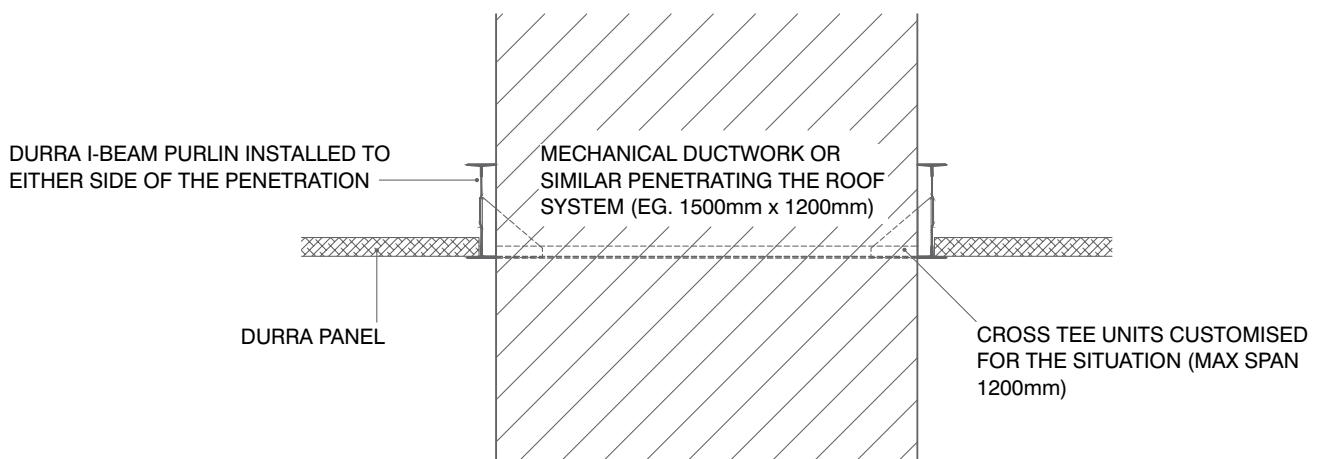
Penetration Details

Penetration Greater Than Full Width Of Ceiling Grid

Plan



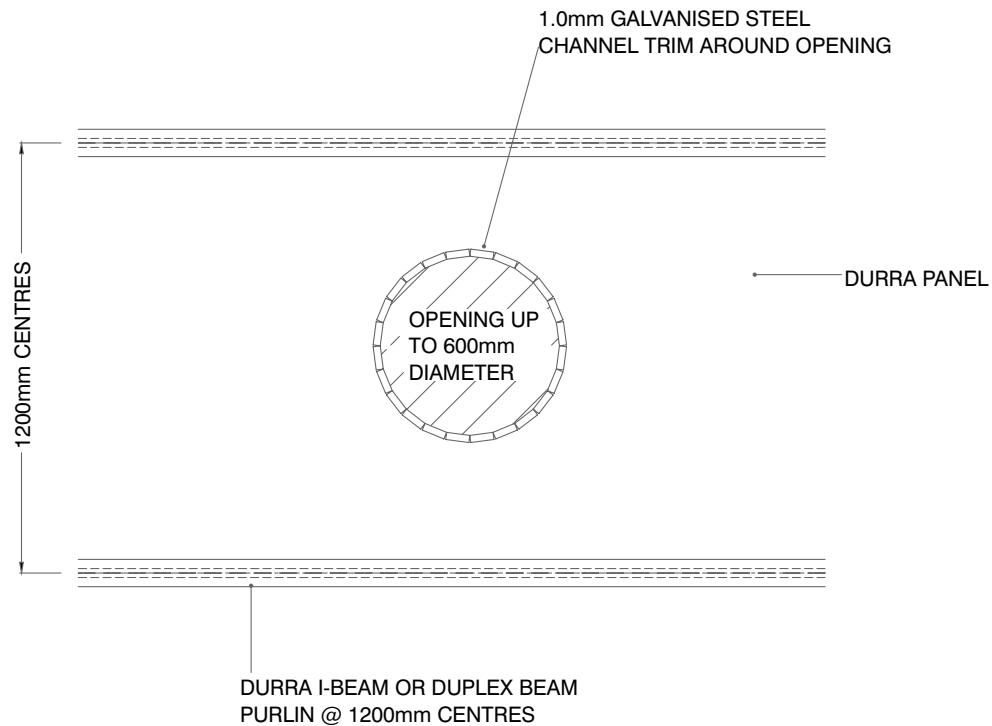
Section



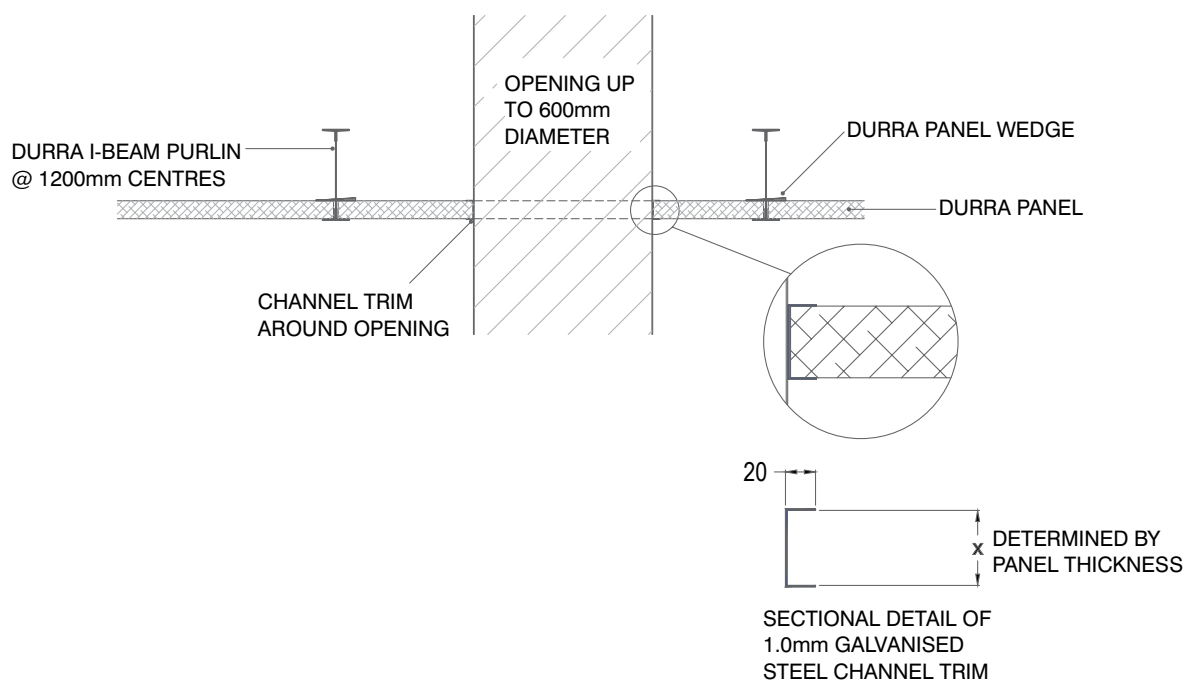
Penetration Details

Circular Penetration Up To 600mm In Diameter

Plan



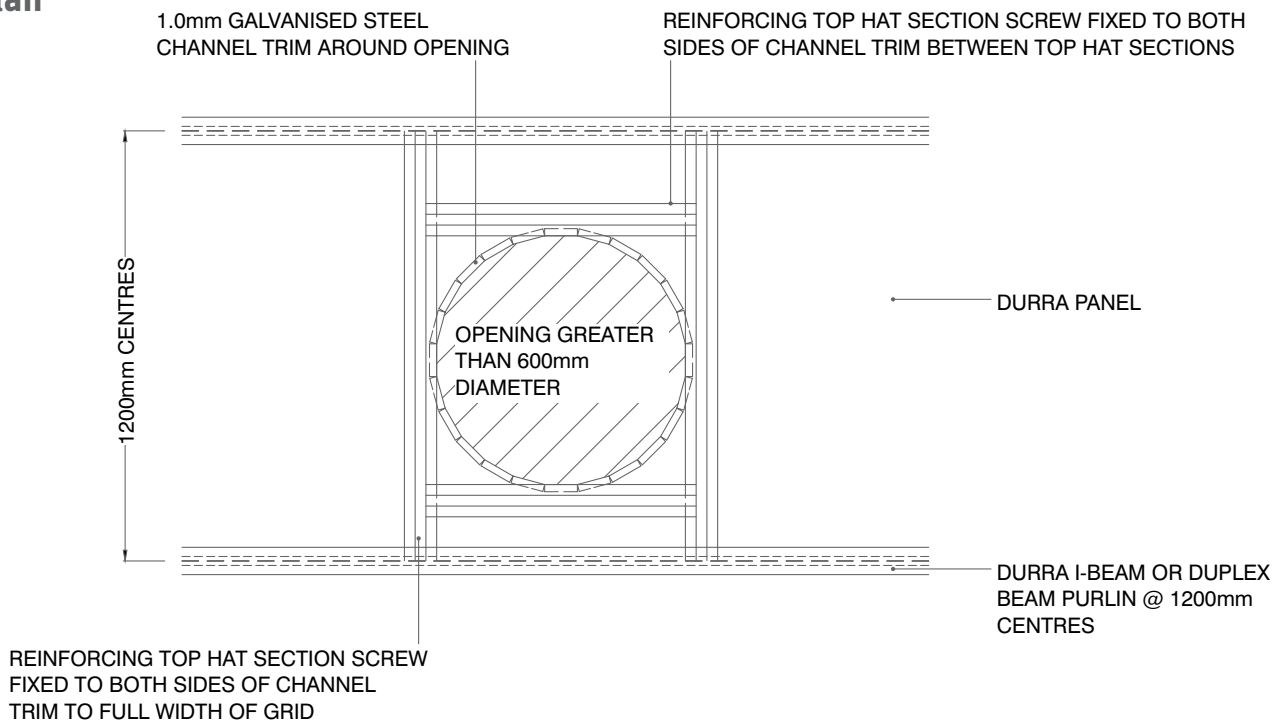
Section



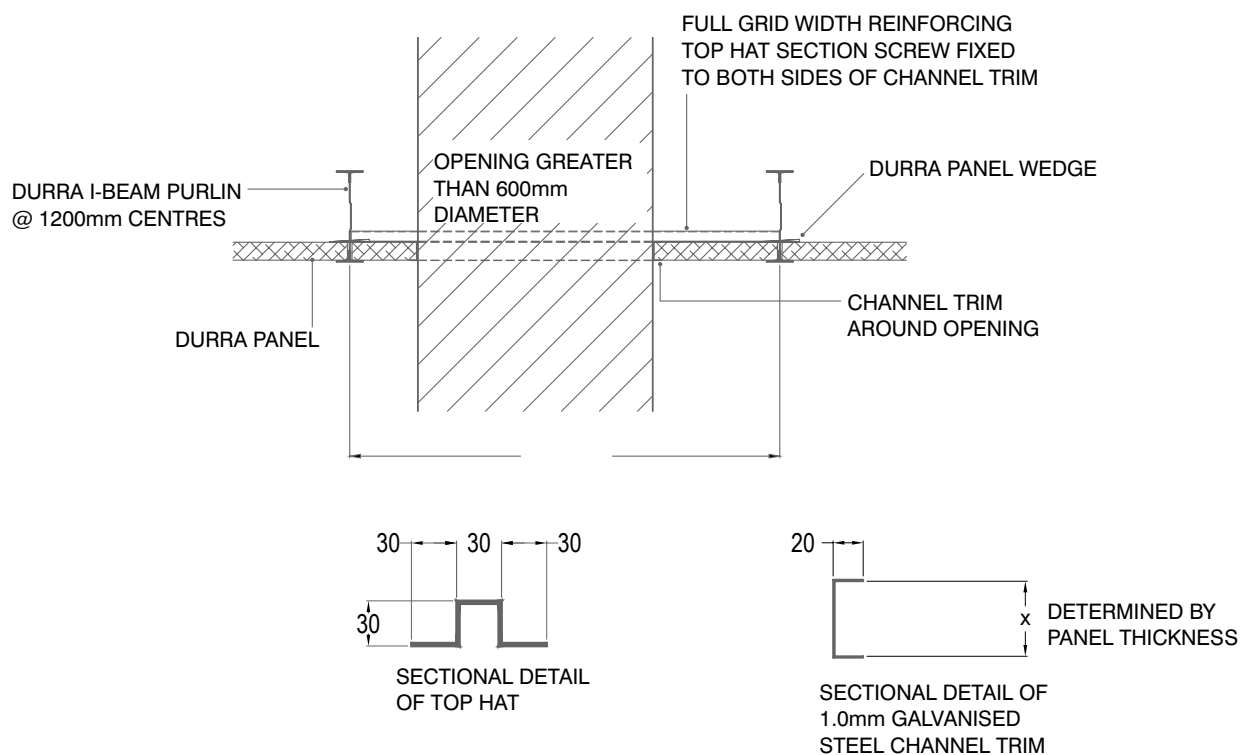
Penetration Details

Circular Penetration Greater Than 600mm In Diameter

Plan



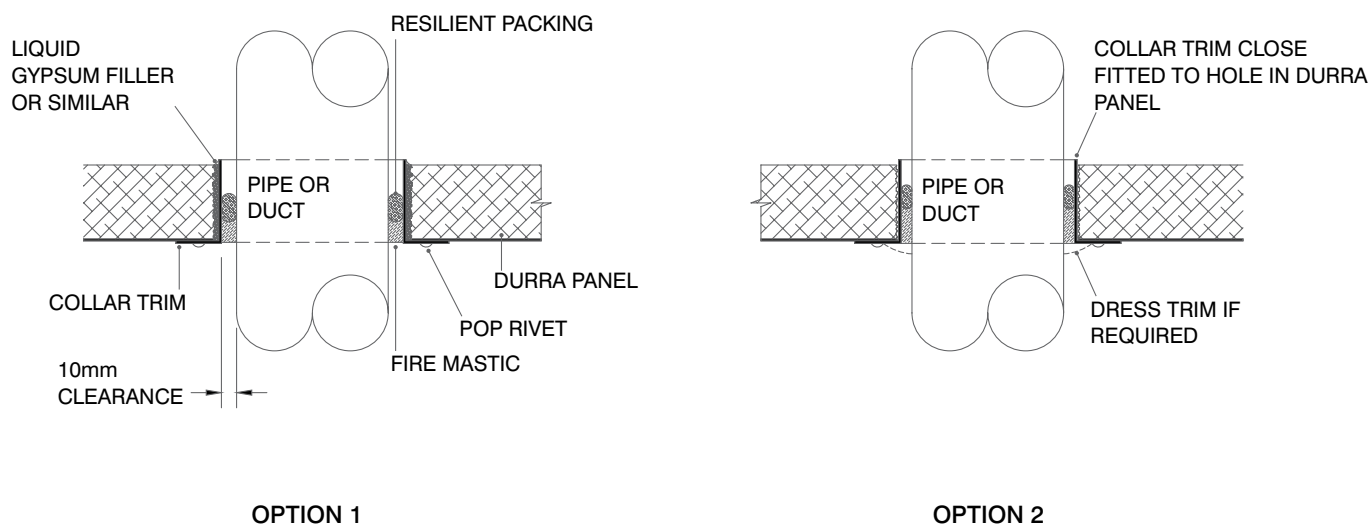
Section



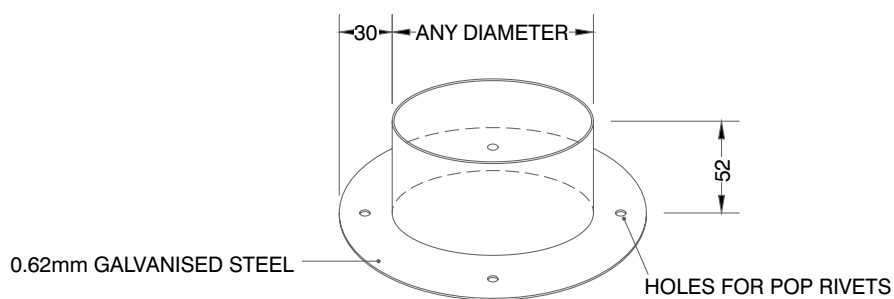
Penetration Details

Small Sprinkler Pipe

Section



Collar Trim Detail



COLLAR TRIM

Section 9

Specification and Ordering

Sample Specification	9.1.1
Durra Panel Type / Finish Guide	9.2.1
Durra Steel Sections Guide	9.2.2
Procedure To Order Ortech Goods	9.3.1
Delivery To Site Instructions Form	9.3.6

NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Sample Specification

Durra Panel Roof/Ceiling System

Durra Steel Section Purlins

1. Durra **(Insert Durra Purlin Type) (Insert Steel Finish)** spaced at 1200mm centres as indicated on drawings.
2. The Durra **(Insert Durra Purlin Type)** shall be fixed with a cleated connection and in accordance with the manufacturer's recommendations.

Durra Tee Units

3. Durra Panels to be joined in their length by Durra Tee Units – **(Insert Tee Unit Type) (Insert Steel Finish)**. Tee Units are to be spaced at nominal quarter, third or half points to produce equal length Durra Panels between structural supports.
4. Durra Tee Units – **(Insert Tee Unit Type) (Insert Steel Finish)** are to be connected to the web of Durra **(Insert Durra Purlin Type) (Insert Steel Finish)** with a bolted connection through pre-punched holes in accordance with the manufacturers recommendations.

Durra Panel

5. Durra Panel **(Insert Durra Panel Type) (Insert Durra Panel Finish)**
6. Durra Panel **(Insert Durra Panel Type) (Insert Durra Panel Finish)** is to be provided with 25mm perimeter support. Durra Panel must be mechanically restrained / clamped down into the Durra Steel Section grid using Durra Galvanised Steel Wedges. The wedges are placed in alternating directions through factory punched slots in the web of Durra Steel Sections and hammered home. The wedges are spaced at nominal 450mm centres along the beam web and through upstand lugs provided in the Durra Tee Units.
7. For maximum available lengths of Durra Panel, please refer to reference page 1.3.5.

Contact Details

8. Ortech Industries
Phone: (03) 9580 7766
Fax: (03) 9587 1628
Email: ortech@ortech.com.au
Web: www.ortech.com.au

Durra Panel Wall System - Face Fixed Back To Steel Wall Girts / Timber Framing

Durra Panel

1. Durra Panel **(Insert Durra Panel Type) (Insert Durra Panel Finish)** – including biscuits and screws to areas as indicated on drawings.
2. Refer to the drawings for the extent of each finish.
3. Durra Panel are to be stacked horizontally or vertically and fixed back securely to steel wall girts / timber framing using construction adhesive and fixings spaced at nominal 450mm centres.
4. The Durra Panel is to be connected along the long edge of each panel using the proprietary biscuit connectors.
5. Perimeter fixings are to be concealed using a combination of Durra Aluminium sections - Natural Anodized or powdercoat finish.
6. Vertical joints are to be concealed with Durra A6 Snaplock Aluminium Cover Strap Natural Anodized or powdercoat finish.
7. Horizontal joints between panels are to be concealed with Durra Aluminium Friction Fit Tee Section (installed with a continuous bead of construction adhesive) - Natural Anodized or powdercoat finish.
8. Durra Aluminium Angle - Natural Anodized or powdercoat finish fixed to perimeter of each bay.

Contact Details

9. Ortech Industries
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Fax: (03) 9587 1628
Email: ortech@ortech.com.au
Web: www.ortech.com.au

Durra Panel Wall System: Durra Panel And Durra Steel Sections

Durra Steel Section Wall Girts

1. Durra **(Insert Durra Wall Girt Type) (Insert Steel Finish)** spaced at 1200mm centres as indicated on drawings.
2. The Durra **(Insert Durra Wall Girt Type)** shall be fixed with a cleated connection and in accordance with the manufacturer's recommendations.

Durra Tee Units

3. Durra Panels to be joined in their length by Durra Tee Units – **(Insert Tee Unit Type) (Insert Steel Finish)**. Tee Units are to be spaced at nominal quarter, third or half points to produce equal length Durra Panels between structural supports.
4. Durra Tee Units – **(Insert Tee Unit Type) (Insert Steel Finish)** are to be connected to the web of Durra **(Insert Durra Wall Girt Type) (Insert Steel Finish)** with a bolted connection through pre-punched holes in accordance with the manufacturers recommendations.

Durra Panel

5. Durra Panel **(Insert Durra Panel Type) (Insert Durra Panel Finish)**
6. Durra Panel **(Insert Durra Panel Type) (Insert Durra Panel Finish)** is to be provided with 25mm perimeter support. Durra Panel must be mechanically restrained / clamped down into the Durra Steel Section grid using Durra Galvanised Steel Wedges. The wedges are placed in alternating directions through factory punched slots in the web of Durra Steel Sections and hammered home. The wedges are spaced at nominal 450mm centres along the beam web and through upstand lugs provided in the Durra Tee Units.
7. For maximum available lengths of Durra Panel, please refer to reference page 1.3.5.

Contact Details

8. Ortech Industries
Phone: (03) 9580 7766
Fax: (03) 9587 1628
Email: ortech@ortech.com.au
Web: www.ortech.com.au

Durra Panel Type / Finish Guide

Durra Panel Type

DURRA PANEL TYPE	DESCRIPTION
S50	Durra Panel Nominal 50mm thickness
S58	Durra Panel Nominal 58mm thickness

Durra Panel Finish

Please refer to **SECTION 1: Durra Panel - Various Finishes** or consult an Ortech Technical Representative for further technical advice regarding Durra Panel finishes.

DURRA PANEL FINISH	SUITABLE APPLICATION		
	ROOF/CEILING SYSTEM	WALL SYSTEM: FIXED BACK TO FRAME	WALL SYSTEM: WITHIN DURRA WALL GIRTS
PLAIN	✓	✓	✓
LUXOLTEX FINE	✓	✓	✓
HARDBOARD	✓	✓	✓
PLYWOOD	✓	✓	✓
CEMENT SHEET	✓	✓	✓
COLORBOND	✓	✓	✓
ACOUSTIC PATTERN PLAIN (HARDBOARD)	✓	✓	✓
ACOUSTIC PATTERN LUXOLTEX FINE	✓	✓	✓
ACOUSTIC PATTERN CEMENT SHEET	✓	✓	✓
SOUNDSORB PLAIN (POLYESTER)*	✓		✓
SOUNDSORB FABRIC FACED*	✓		✓
SOUNDSORB PERFORATED CORRUGATED*	✓		✓
SOUNDSORB PERFORATED FOIL*	✓		✓
SOUNDSORB PERFORATED ALUMINIUM*	✓		✓

Please Note: Biscuits and Screws must be included when specifying a 'Durra Wall - Fixed back to frame' system.

* Please specify thickness and density of insulation.

* Ortech Industries recommends Durra Panels to be painted.

Durra Steel Sections Guide

Durra Steel Section Purlin / Girt Type

BEAM PROFILE	PURLIN / GIRT TYPE
DUPLEX BEAM	80 Duplex Beam Purlin/Wall Girt 125 Duplex Beam Purlin/Wall Girt 150 Duplex Beam Purlin/Wall Girt 175 Duplex Beam Purlin/Wall Girt 200 Duplex Beam Purlin/Wall Girt 250 Duplex Beam Purlin/Wall Girt
I-BEAM	175 I-Beam Purlin/Wall Girt 200 I-Beam Purlin/Wall Girt 225 I-Beam Purlin/Wall Girt 250 I-Beam Purlin/Wall Girt 300 I-Beam Purlin/Wall Girt 350 I-Beam Purlin/Wall Girt 350HS I-Beam Purlin 400 I-Beam Purlin

Durra Tee Unit Type

TEE UNIT TYPE	DESCRIPTION
TYPE A	Tek screw application
TYPE D2	Bolted application
TYPE D3	Bolted application
TYPE D4	Bolted application

Durra Steel Finish

Galvanised Steel (Standard)
Powdercoat Paint
Epoxy Paint

Procedure To Order Ortech Goods

Guide: To Prepare And Order Goods

The following pages are a guide of how to prepare the required documents when ordering Ortech goods.

Materials Checklist

Items That Should Be Included With Your Order:

- ☐ Purlin Marking Plan
- ☐ Purlin Shop Drawings: showing all required notching, punching and applied finishes if applicable
- ☐ Tee Unit types, quantities and sizes
- ☐ Durra Panel Cutting List: showing all panel sizes, finishes and quantities
- ☐ Durra Steel angles and channel if required
- ☐ Deliver to Site Instructions Form
- ☐ Purchase Order
- ☐ Packing List

Please ensure you submit all items listed above when ordering. Inadequate documentation may delay the processing of your order.

Contact Details

If you have any problems with documentation please contact Ortech Industries for assistance .

Ortech Industries

Phone: (03) 9580 7766

Fax: (03) 9587 1628

Email: ortech@ortech.com.au

Web: www.ortech.com.au

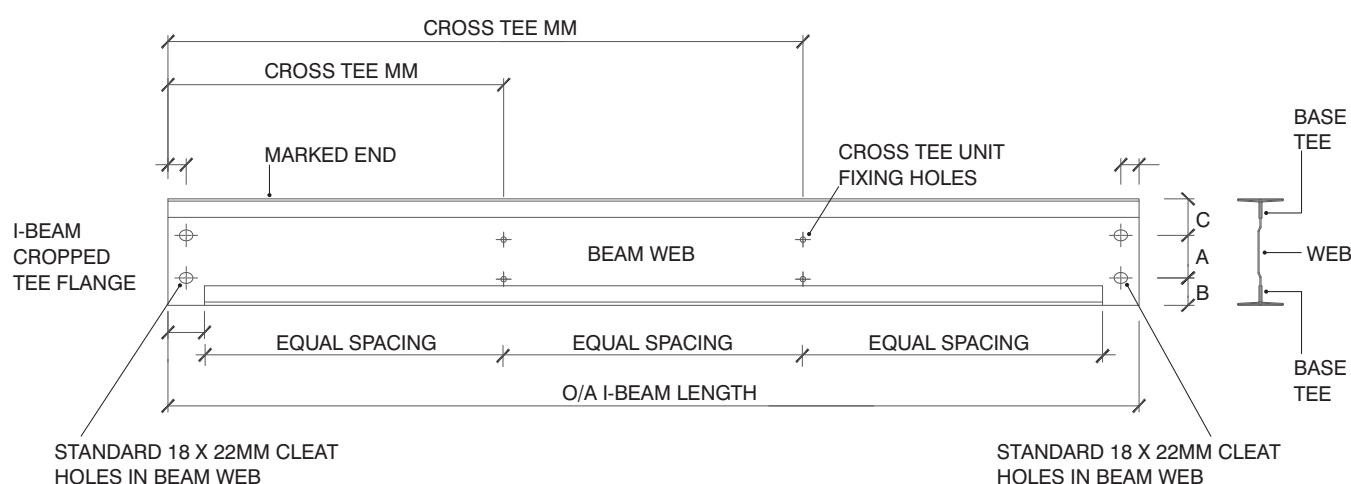
Durra Steel Sections - Purlins And Wall Girts

- Purlin and Wall Girt Shop drawings must illustrate all required **notching** and **punching**.
- Lengths and applied finishes (if applicable) must be clearly noted on both shop drawings and Purchase Order.
- Figure 1 below is an illustration of our standard beam punchings for Tee Units and cleat holes. Contact Ortech Industries for non-standard, special order punchings and beam notchings - price on application.

How To Locate The Positioning Of Tee Unit Bridging Along Purlins And Girts:

1. Determine the overall length the Durra Beam is to span between Structural support members.
2. Determine the overall length of Base Tee of the Durra Beam in accordance with the Durra Typical Cleat Connection, Refer to 3.4.3. Also available from the downloads section: www.ortech.com.au.
3. Divide the overall length of Base Tee section into half, third or quarter points at a distance no greater than 3600mm apart.
4. The Tee Units are to be located at a spacing which allows for equal length Durra Panels to be installed per bay.

Figure 1



Tee Unit Bridging

How To Determine The Length Of Tee Units:

1. Durra Purlins and Wall Girts are typically spaced at 1200mm grid centres.
2. Standard Tee Units are produced to suit a typical 1200mm grid.
3. In areas where purlin or girt spacing is less than 1200mm the Tee Unit length is determined by the grid spacing from centre line to centre line. Example; Tee Unit to suit 350mm grid.

Tee Unit Bridging Suitability

TEE UNIT	DUPLEX BEAM	I-BEAM
TYPE A TEK SCREW APPLICATION	125 150	N/A
TYPE D2 BOLTED APPLICATION	125 150 175 200 250	175 200 225 250
TYPE D3 BOLTED APPLICATION	200 250	300 350
TYPE D4 BOLTED APPLICATION	N/A	350 400

Durra Panel

- A document with all Durra Panel Lengths and widths is required, whether it be on a separate cutting list or listed on the Purchase Order.
- Panel Finishes must be clearly noted on both drawings, cutting list and Purchase Order.

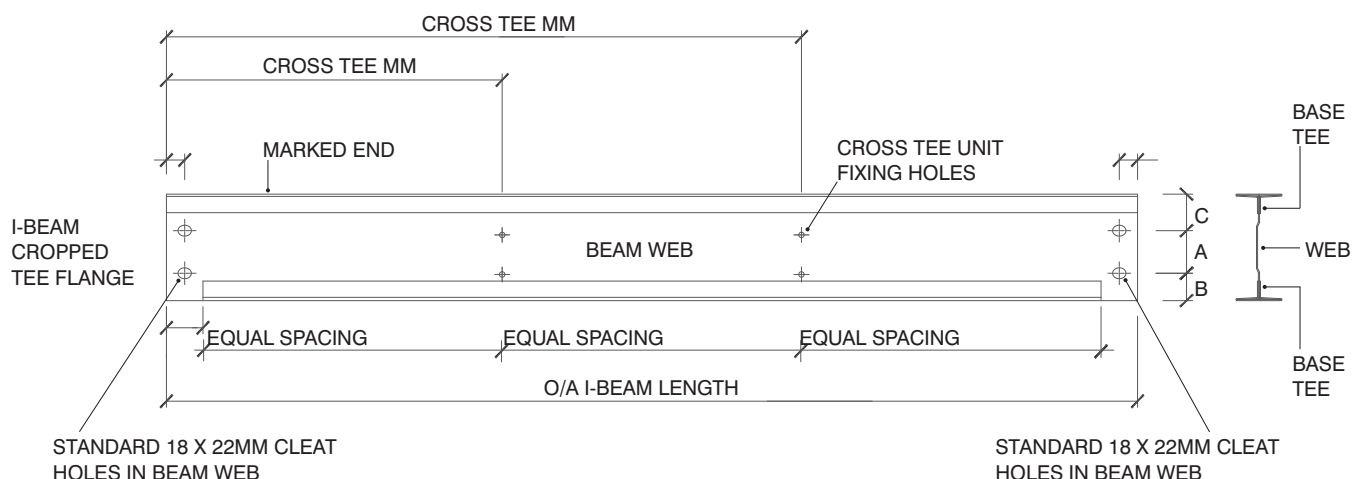
Panel Dimensions

Durra Panel: Width

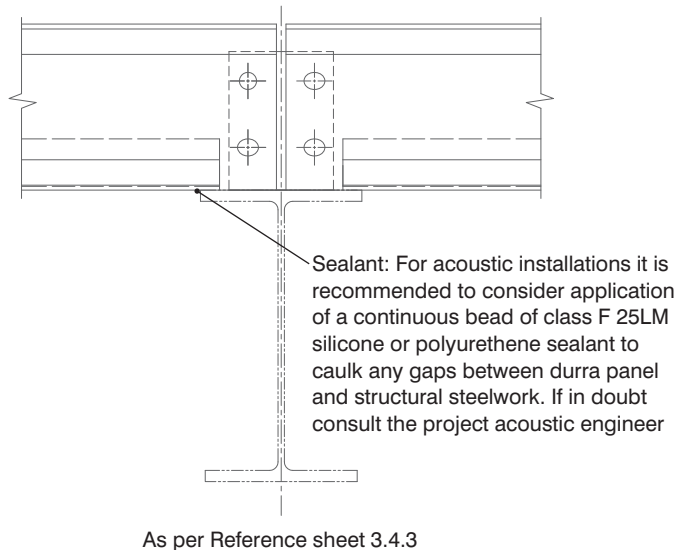
1. Durra Panel is extruded in 1187mm width to suit the standard spacing of Durra Beams at 1200mm grid centres. i.e. a **13mm** tolerance between Durra Beams.
2. Where the grid spacing is less than 1200mm grid, the same 13mm width tolerance is required. i.e. a 587mm Durra Panel to fit a 600mm grid spacing.

Durra Panel: Length

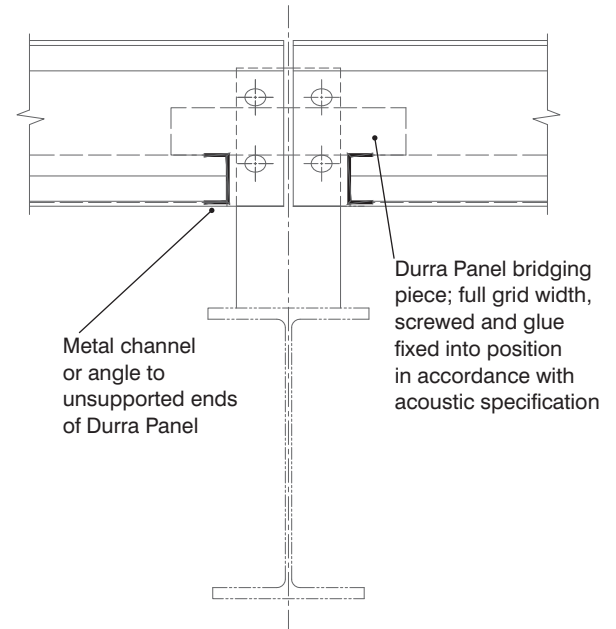
1. Durra Panel must have 25mm perimeter support. This support is typically provided by Durra Beams and Tee Unit Bridging bottom flanges.
2. The Length of Durra Panel is determined by the centre line spacing of the Tee Unit Bridging less a tolerance of **24mm**.
3. For maximum available lengths of Durra Panel, please refer to reference page 1.3.5.



Typical Cleat Connection



Typical Raised Cleat Connection



Panel Finish

- Clearly note Durra Panel type and finish on all documentation.

Please refer to **Section 1: Durra Panel** for information about various finishes available or via our website, otherwise please consult an Ortech Representative for assistance.

Delivery To Site Instructions

Please submit a **Delivery to Site Instructions** form which can be found on the following page.

Revit And Autocad Profiles And Details

A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech website.
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Please contact our technical department for further assistance.

Contact Details

If you have any problems with documentation please contact Ortech Industries for further advice.

Ortech Industries
 Phone: (03) 9580 7766
 Fax: (03) 9587 1628
 Email: ortech@ortech.com.au
 Web: www.ortech.com.au

Delivery to Site Instructions

Customer Name: _____

Project Name: _____

Delivery Address: _____

Site Phone Number: _____

Contact Person: _____

1. Site is:

☐ Rural	☐ Metro	☐ Industrial
☐ Residential	☐ Commercial	
2. Site access surface is:

☐ Bitumen	☐ Gravel	☐ Dirt/Grass
----------------------------------	---------------------------------	-------------------------------------
3. Does rain affect access to Property:

☐ Yes	☐ No
------------------------------	-----------------------------
4. Does the site have semi-trailer access:

☐ Yes	☐ No
------------------------------	-----------------------------
5. Unloading Method:

☐ Crane on site	☐ Forklift
☐ Hand Unload	☐ Crane Truck
☐ Forklift Truck	☐ Other _____
6. Does the delivery driver require an on-site induction:

☐ Yes	☐ No
------------------------------	-----------------------------
7. Any other details that may assist: _____

Please Note: Should delivery not be possible due to lack of information a re-delivery charge may apply.

Section 10

Modular Buildings

Introduction..... 10.1.1

Modular Construction System 10.1.2

The Package 10.1.3

Standard Construction Details..... 10.2.1

Floorplans 10.3.1

Project Images 10.4.1

NOTE: A full listing of Revit and Autocad profiles are available in the Downloads section on the Ortech Industries website:
www.ortech.com.au/downloads/cad-drawings-and-typical-details

Introduction

The Ortech Eco-Form modular building system is a major development for environmentally sustainable accommodation. From design to construction and re-usability, modular customisation is the key concept of our Ortech Eco-Form System; Durra Panel, Walls and Ceilings combined with modular steel framing.

A comfortable and private structure for any use; it is prefabricated, extendable, and relocatable, suitable for temporary individual dwellings to large scale accommodation and facilities. This system is also demountable and can be flat packed for economical storage or be combined together to construct larger buildings with endless possibilities.

The life cycle analysis of Ortech Eco-Form structures sets a new industry benchmark for innovation in sustainable design.

Sustainable Design

The use of Durra Panel as an internal lining material for Eco-Form modular buildings has set a new benchmark for sustainable design;

- **Low Embodied Energy:** The Durra Panel manufacturing process combined with local biomass raw material results in exceptionally low embodied energy.
- **Positive Social Impact:** Innovatively utilizing an agricultural biomass by-product provides supplementary economic activity to regional areas - sustainably.
- **Recycling and Disposal:** Durra Panel is fully recyclable and readily biodegradable, and can be beneficially disposed of as mulch or soil conditioner, avoiding landfill disposal.
- **CO₂ Emission Sequestration:** Based on a renewable biomass by-product, Durra Panel sequesters CO₂ emissions from the atmosphere.
- **Indoor Environment Quality:** Avoiding the requirement for additive chemical binders common to other rigid board products, Durra Panel has exceptionally low VOC levels, contributing to healthier indoor environments.

Durra Panel has excellent acoustic and thermal properties attributing to energy efficiency; a key measure of sustainability in housing. Demountability, re-use and recyclability are significant features of our sustainable Eco-Form systems – **designing for life**.



Modular Construction System

A prefabricated, modular construction system based on a 1200mm grid. The Eco-Form internal walls and ceilings are constructed with a lightweight steel framework and Durra Panel. Materials can be delivered to site flat packaged for assembly or alternatively, the building can be constructed off-site, transported and craned into position.

Eco-Form buildings are simple to construct and can be erected in a matter of days with the use of building tradesman and basic tools. A robust, durable building, capable of being assembled anywhere, even in the remotest and inaccessible locations.

A key feature of the system, allows for a building to be disassembled into flat packages and stored at the end of its service life and be relocated, reconfigured, and extended into virtually any floor plan as required, leaving no trace of the previous building.

The fully modular design, allows Ortech Eco-Form buildings to be used for a wide variety of temporary or permanent accommodation forms, ranging from simple eco villages, remote housing, and barracks, to larger service buildings such as school and training facilities, community buildings and mass accommodation.

A standard Eco-Form building uses concrete pads to form its foundation. Different types of foundation systems may also be adapted including: slab on ground, concrete plinth, or timber/steel foundation and above ground stilt type construction.



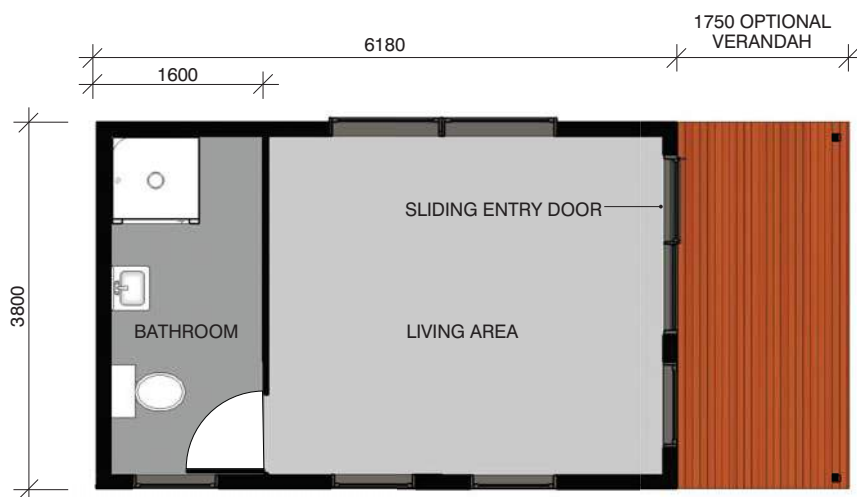
The Package

Ortech Industries have produced the Eco-Form buildings with simplicity in mind to suit single DIYs to remote mass accommodation. Endless opportunities are available with custom designed floor plans and roof structures to suit your specifications according to site and climate zoning.

We offer you a standard unit with the choice to add on kitchen and bathroom furnishing packages, energy efficient options and installation of services. Please contact an Ortech Technical representative to customize your package today.

Floor Plans

Eco-Form buildings are based on a 1200mm grid module system. The diagram below is an example of a four module studio with verandah module (1500mm x 3600mm). Additional modules of 1200mm (lengths and widths) may be added into the floor plan for larger accommodation. Internal walls may be positioned to suit your specific needs.



Options For Energy Efficient Star Rating

By ensuring that Eco-Form buildings are minimum 6 Star homes, we, as a society, are further enhancing the sustainability of our future and reducing greenhouse gas emissions. Simple design considerations include; orientation, ventilation, shading and insulation. For further advice please contact an Ortech Technical representative.

Flat Packaged Or Pre-Assembled - Ex Works Ortech Bendigo Victoria

Eco-Form buildings are generally delivered to site flat packaged on a Tray/Crane truck complete with installation instructions. The majority of materials supplied are pre-cut for simple assembly. The buildings may also be delivered to site as an assembled unit for crane hoisting into position, including electrical fitout and internal plumbing. Installation of services subject to P.O.A.

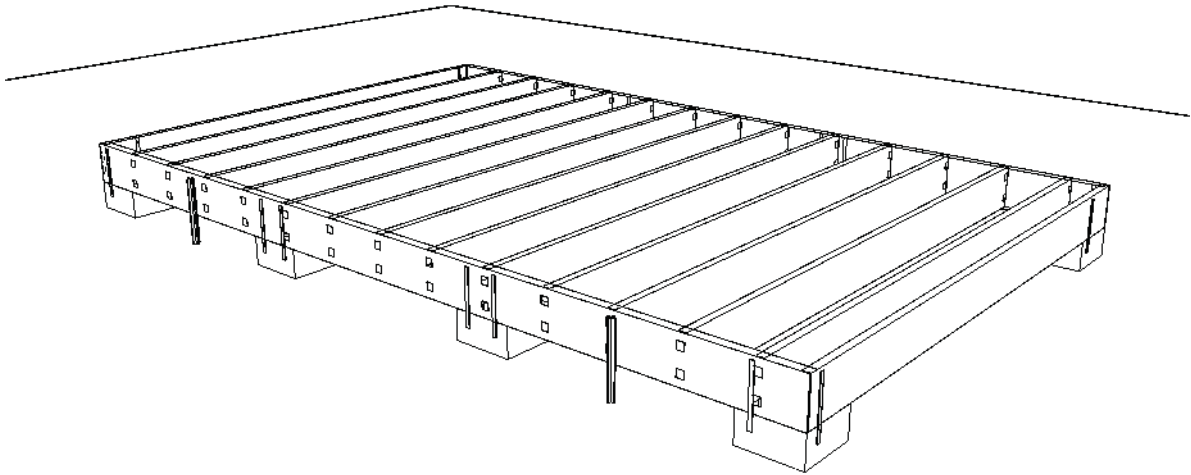
Delivery subject to P.O.A.

Ortech Eco-Form Standard Unit Flat Package System Includes:

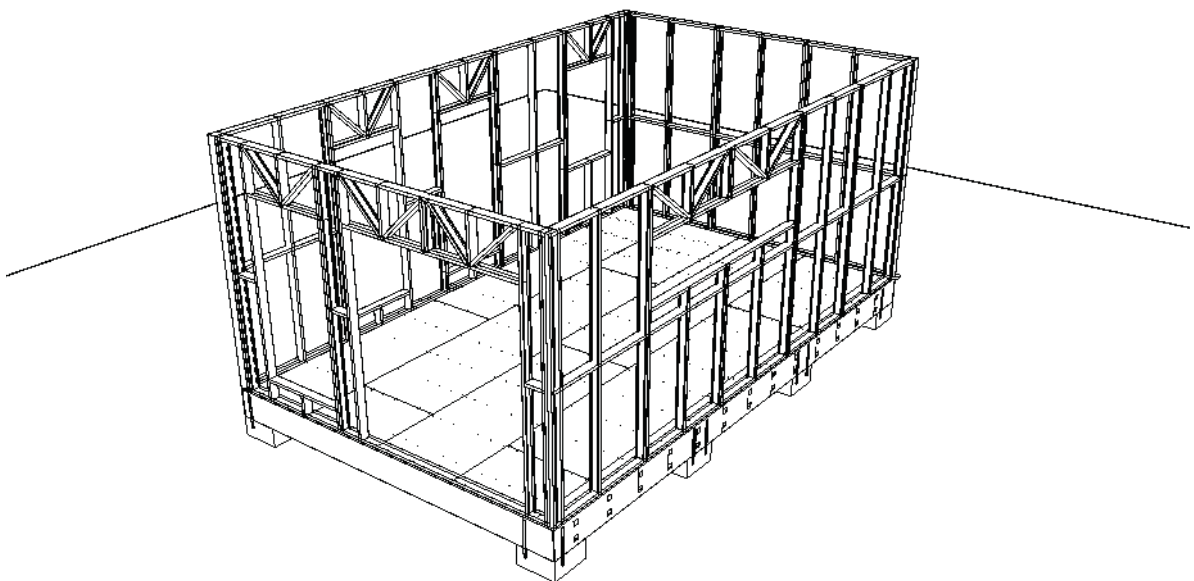
CONSTRUCTION SYSTEM	DESCRIPTION
FLOORING	• Concrete pads (permanent stumps optional extra) • Galvanised steel frame (purlin joists & channel bearers) • Tongue & groove panels
WALLS	• Galvanised Steel frame • Ortech Panels S50 - plain finish • Sisalation & Insulation batts
CEILING	• Ceiling height = 2.5m • Galvanised Steel frame • Ortech Panels S50 - plain finish • Sisalation & Insulation batts
EXTERNAL	• Colorbond corrugated roof & wall cladding • Colorbond fascia gutter, flashings, downpipes
DOORS & WINDOWS	• Aluminium doors & windows with flyscreens (external) • Pre hung doors inc door furniture, jambs & sills • Internal architraves
OTHER	• Fasteners, brackets, adhesive, nails, sealant • Installation manual

Standard Construction Details

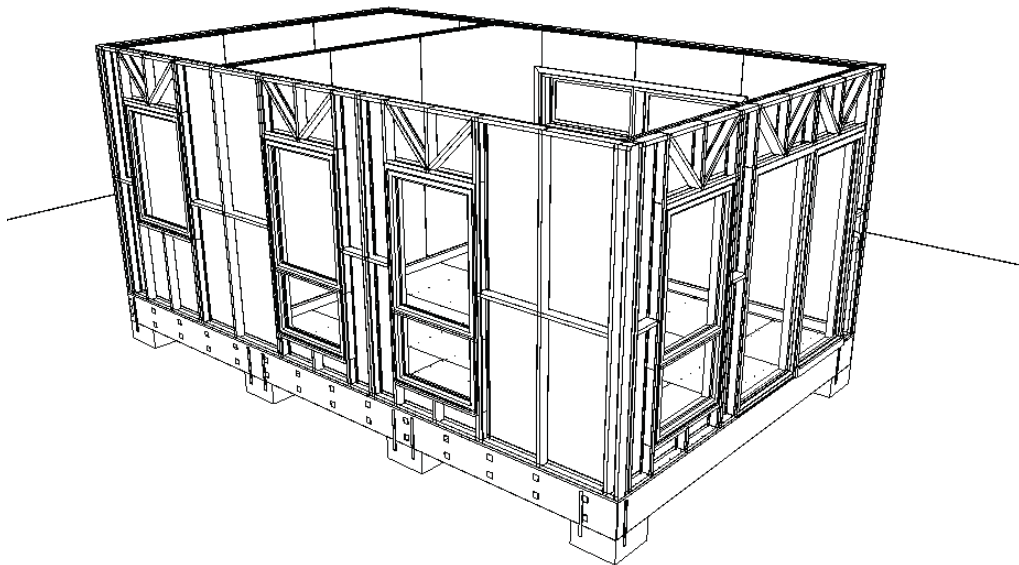
Sub Floor Framing



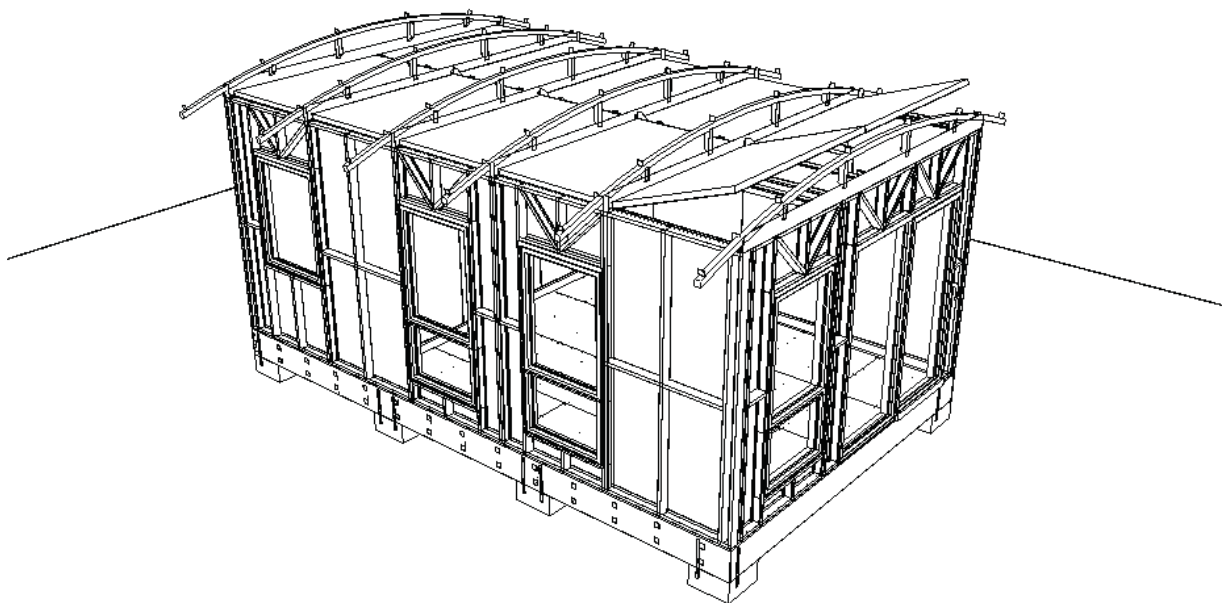
Frame Construction



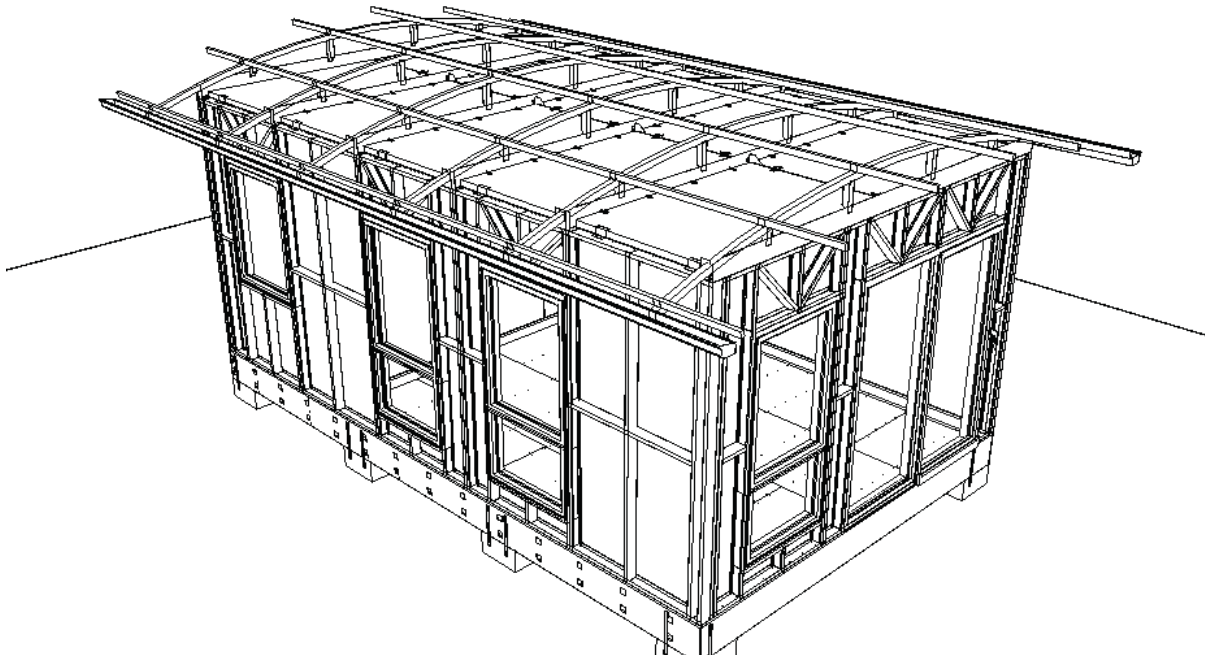
Durra Wall Panel Installation



Durra Ceiling Panel Installation



Roof Installation

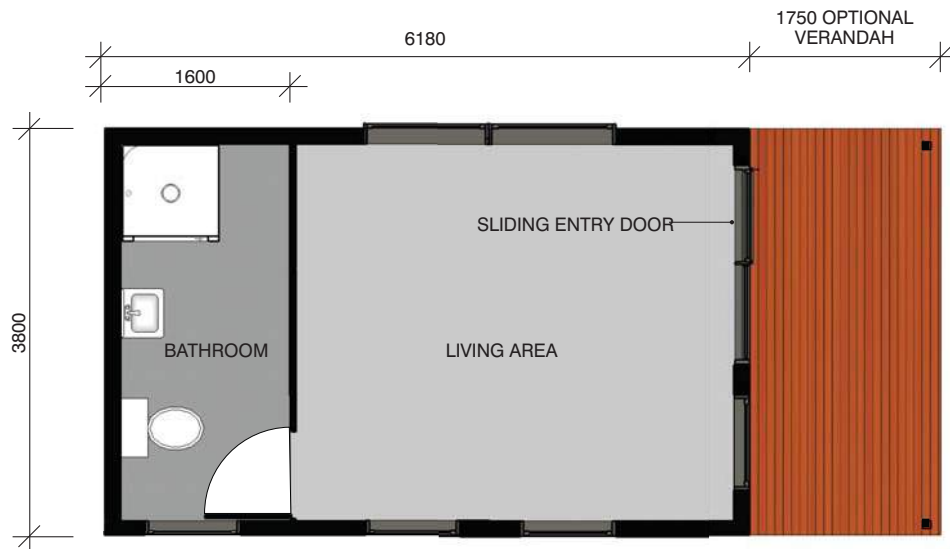


Completed Building



Floor Plan

Torquay 5



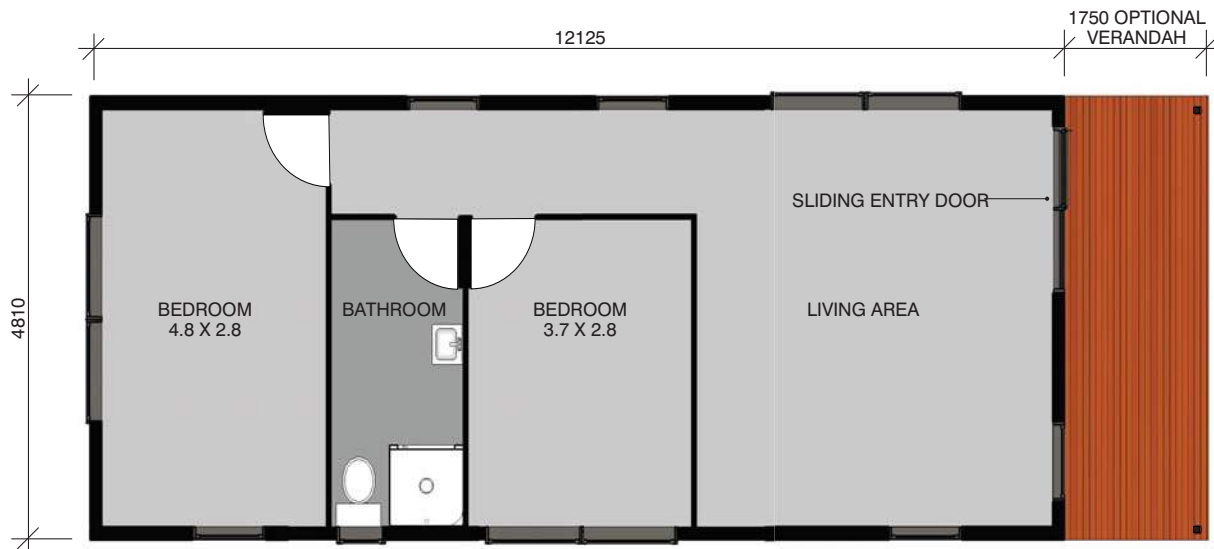
Torquay 6



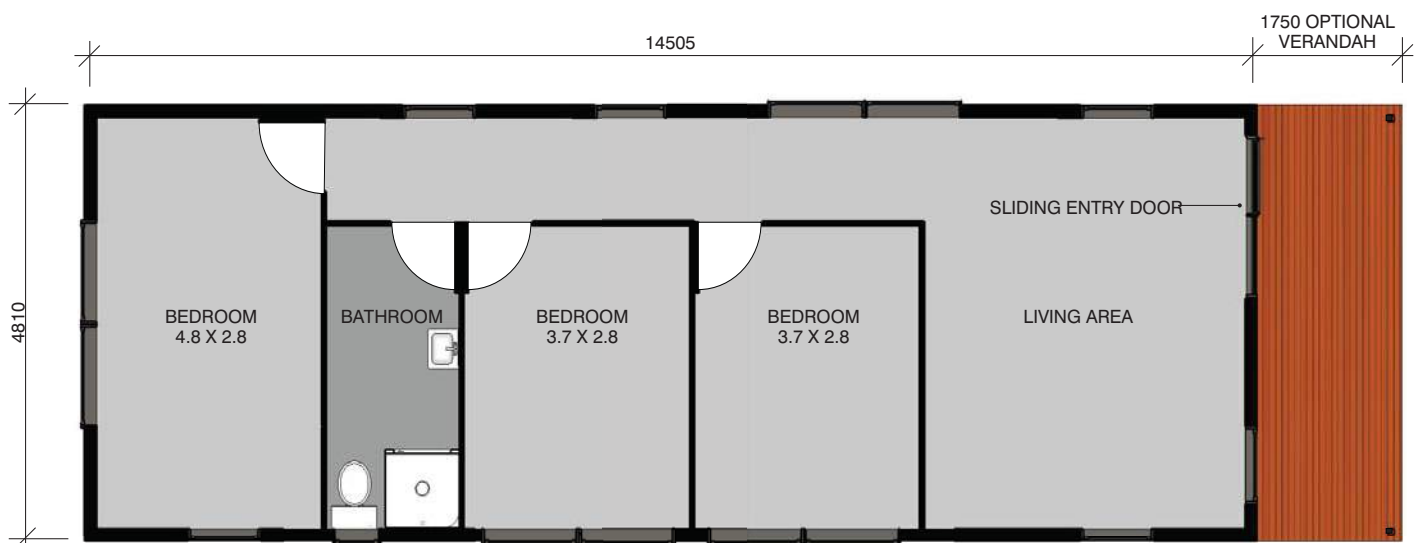
10.3.2

Modular Buildings

Coolum 10



Coolum 12



Project Images



