

LIGHT STEEL FRAME

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Futurecon is the South African leader in Light Steel Frame construction as well as specializing in other innovative green construction methods such as Ikhaya Futurehouse Panels and ETICS.



02 | LIGHT STEEL CONSTRUCTION

Steel is a superior building material with the future in mind. Apart from allowing green construction practices, building with light steel frames is faster, predictable, more precise and more cost-effective.



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ETICS (External Thermal Insulation Composite System) is a system comprising of roll-formed steel profile sections, fixed together, and an internal lining consisting of Gyproc RhinoBoard fixed to the steel frame work.



04 | MEMBERSHIPS

Great work ethic underpins all of our business activities and is an area which we take seriously. Our memberships also promote our commitment to good health, safety and environmental management.

01 ABOUT FUTURECON

Futurecon is the South African leader in Light Steel Frame construction as well as specializing in other innovative green construction methods such as Ikhaya Futurehouse Panels and ETICS.

With over 16 years' experience working in both North America and Southern Africa, we have been actively building in South Africa since 2010 and have successfully completed over 30 projects to date.

We offer turnkey services within the residential, commercial, and institutional markets. As a green building solution, light steel building is not only faster than traditional building methods but also stronger, more thermally efficient as well as more cost effective.

Futurecon offers the entire spectrum of construction services, including architectural support, detailed shop drawing design, structural engineering, full project management and onsite turnkey construction. We also offer in-house product and software research, marketing & sales and full property development. We have over 16 years' experience in Light Steel Frame construction, working in both North America and Southern Africa and have been actively building in South Africa since 2010.

We conceptualise, design and construct green buildings from light steel that are beyond imagination. Our remarkable client base have empowered us to build an excellent reputation, which consist of international retail chains, hotel groups, property developers, NGO's as well as private individuals.





02 LIGHT STEEL CONSTRUCTION

The introduction of light steel frame building in South Africa is one of the most exciting developments in recent times – in both the steel and construction industries. Perfected over the last half century, steel frame construction has become the preferred way of building in many countries, including the United States, Canada, Britain, Australia and New Zealand.

It was only fairly recently introduced to our shores and is now growing at an astounding rate of 25% annually in South Africa.

Compared to traditional building methods, light steel frame construction offers the opportunity to erect structures (from residential and commercial, to industrial and institutional) of a higher quality and with less wastage. It is quicker, more cost-effective and more precise than any other building method. The material is fully customizable to the client's requirements and the architectural style.

Steel is a superior building material with the future in mind. Apart from allowing green construction practices, building with light steel frames is faster, predictable, more precise and more cost-effective.





LIGHT STEEL FRAME BENEFITS

QUALITY

- International Product of World Class Standards
- 50 Years Material Warranty
- Factory Precision
- Consistent Material Quality – No Regional Variations
- Produced in Strict Accordance with National and International Standards
- Straight Walls & Square Corners Guaranteed

STRENGTH

- Stronger than Brick & Mortar
- Highest Strength-to-Weight Ratio of any Building Material
- 600 Year Durability
- Dimensionally Stable – Does not Expand / Contract with Moisture Content

COST-EFFECTIVE

- Material Price Stability – Price Spikes Extremely Rare
- Limited Wastage – Only 2% On-Site Wastage (Conventional Building Methods: 30%)
- Lower Transport Cost

GREEN

- Environmentally Friendly as Steel is the worlds most recycled product.
- Green Product / Building Methods & Processes
- 100% Recyclable
- 68% Industry Recycling Rate
- 80% Reduced Carbon Footprint

NON-ORGANIC

- Inorganic – Will Not Rot, Swell, Warp, Split, Crack or Creep
- Invulnerable to Termites, Fungi, Mold and Other Organisms
- Incombustible – Does Not Burn & Does Not Contribute Fuel to Spread Fires
- Free of Resin Adhesives & Other Chemicals
- Superior Thermal & Acoustic Insulation – 1 500% Better than Brick
- Not Affected by Weather Conditions

ARCHITECTURE

- Flexible Application – Any Shape & Design
- Architecturally Attractive
- Designed to Architect Specifications & Engineering Standards Reduced Foundation Footings & Base Plate Sizes
- Reduced Foundation Requirements – 10 x Lighter Structure
- Less Probability of Weather / Wind / Earthquake Damage
- Easy to Achieve Complex Designs (For Example Canter Lever)

CONSTRUCTION

- Superior Building Accuracy
- Quick Assembly – 50% Faster than Brick Building
- Shorter & More Predictable Construction Schedules
- Simpler Plumbing & Electrical Installation
- Better Utilization of Sloping Sites
- Less Weight Impact
- Clean, Safe & Orderly Building Site

CUSTOMER

- Earlier Occupation for Customers
- 4% More Lettable Rental Area – Internal Space Increase
- Up to 40% Saving on Electricity due to Superior Insulation

COMMERCIAL













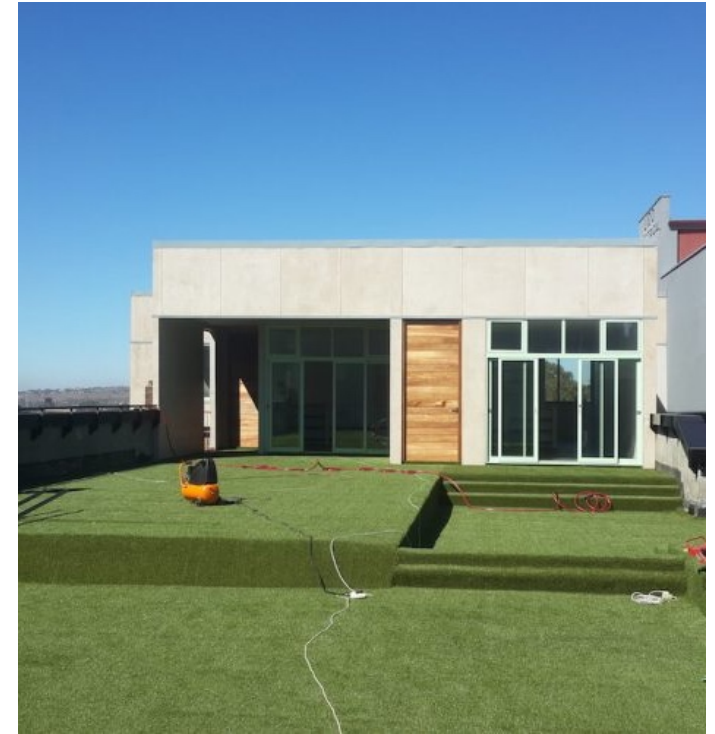
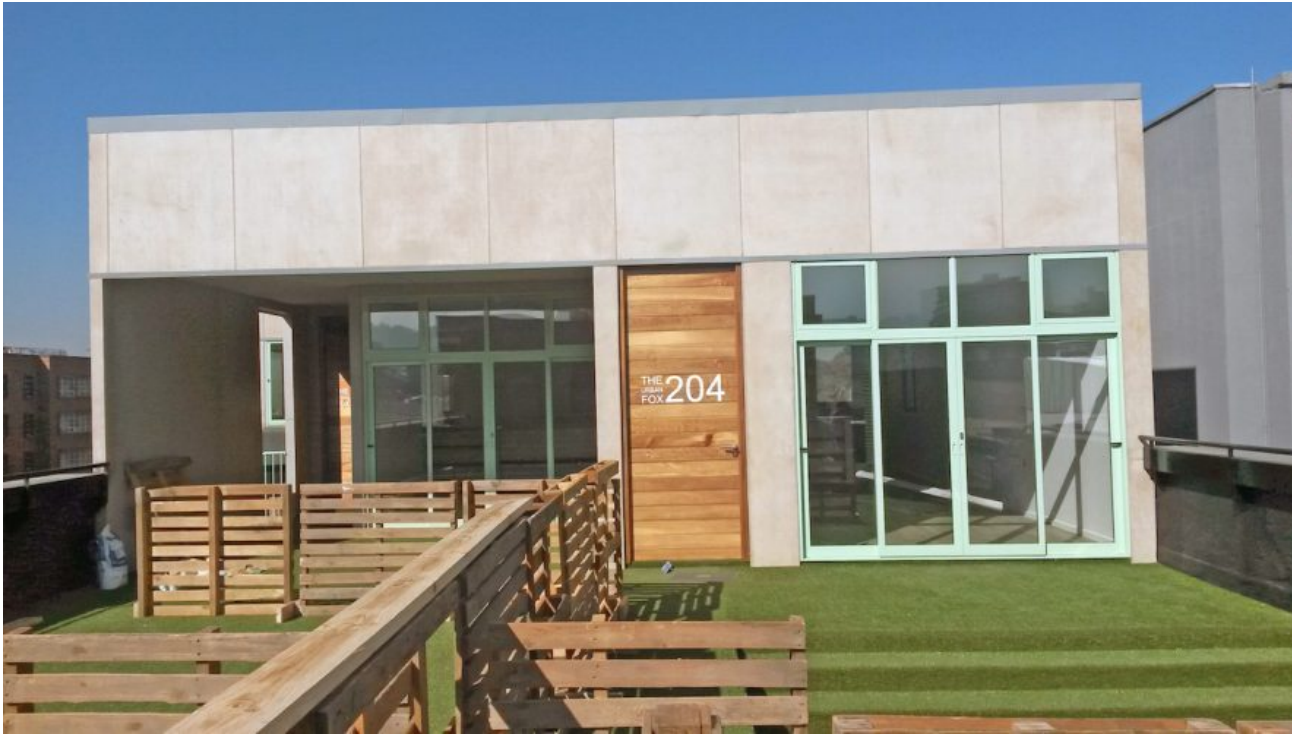




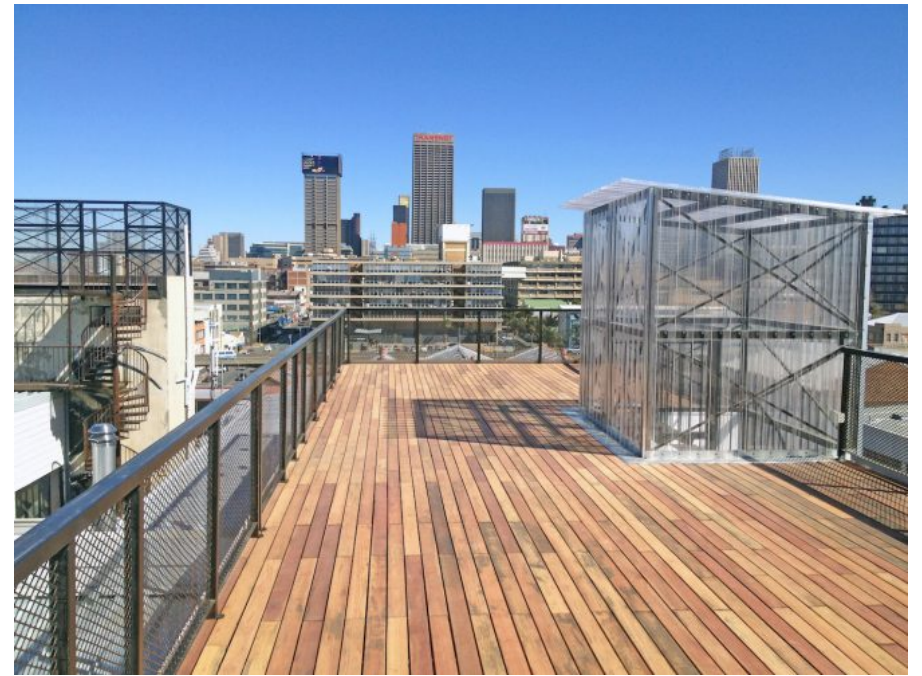


BUILDING ON ROOFTOPS









RESIDENTIAL

















GAME LODGES







03 ETICS

ETICS is a system comprising of roll-formed steel profile sections fixed together as per structural engineer's design, an internal lining consisting of 1 – 2 layers of a 15 mm Gyproc RhinoBoard (as per fire rating requirements) fixed to the steel frame work and finished as desired.

The external lining consists of a moisture barrier membrane (ISOVER 'Ecran Integra. membrane') which is fixed to the steel frame work.

A sheath wall comprising of 12.5 mm Gyproc Glasroc H Board/OSB is then fixed to the frame work. Insulation boards (Neopor or EPS panels to a density not less than 20 kg/ m²) are adhered to the Glasroc H Board/OSB sheath wall using Weber.set Ceramic L adhesive and mechanical fixings as specified by Weber.

A suitable primer is applied to the wall and finally an acrylic resin bonded decorative topcoat as specified by Weber. A sealant is then used to seal the system to ensure water tightness.



ETICS INFORMATION



Weber ETICS: External Thermal Insulation Composite System

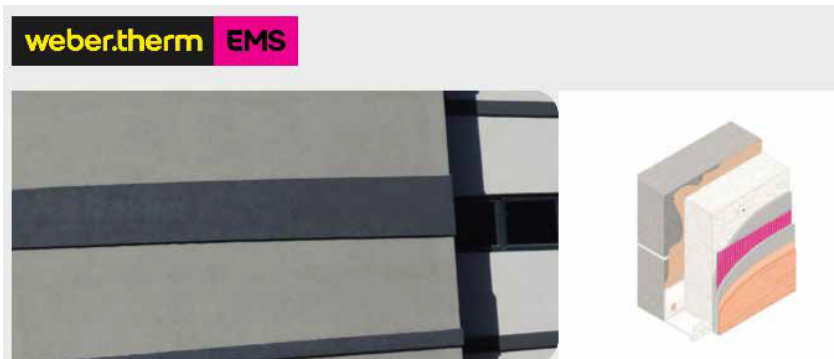


ETICS Systems

Type	Insulation	Reinforcement	Fixings	Undercoat	Topcoat	Finish
weber.therm SFS Glasroc H boards/ OSB Sheath wall	Neopor/EPS panels and/or Glass-Fibre Wool	weber.therm Mesh	Mechan... and/or Adhesive	2 Coats of weber.therm Base-Coat X-treme (3-4 mm each), with Imbedded Mesh to Weber specification	6 mm to 8 mm Polymeric Cement-based Render	Scraped texture or smooth
weber.therm EMS	Neopor/EPS panels and/or Glass-Fibre Wool	weber.therm Mesh	Mechan... and/or Adhesive	2 Coats of weber.therm Base-Coat X-treme (3-4 mm each), with Imbedded Mesh to Weber specification	6 mm to 8 mm Polymeric Cement-based Render	Scraped texture or smooth

weber profiles	Range of standard profiles for use at wall base, stop ends and Expansion joints	Mesh
Component	Description	Dimensions/Quantity
Insulation	Cavity Batt , 102 mm thick at 14kg/m ³ density	1200 mm x 600 mm
EPS/Neopor panels	Grade: SD/FRA. GFC/HGFC free Thermal insulation products for buildings. Factory made products of expanded Polystyrene. Density 24kg/m ³	Size: 600 mm x 1200 mm Thickness 30 mm to 90 mm
weber.therm Mesh	Alkaline Resistant Glass Fibremesh	1,500 m x 50 m Weight: 160 g/m ² Mesh Dimension 3,5 x 3,5 mm
Basecoat X Treme	Factory batched, cement based, fibre reinforced plaster	20 kg
Synthetic Finishes/ Topcoat	Weber, Smooth to rough textured resin bonded plaster for interior/exterior coating with a durable plaster-like textured finish, applied with a trowel on suitably prepared and primed surface. Three thicknesses available i.e. Thicknesses from: 1 mm, 1.5 mm and 2 mm.	35 kg

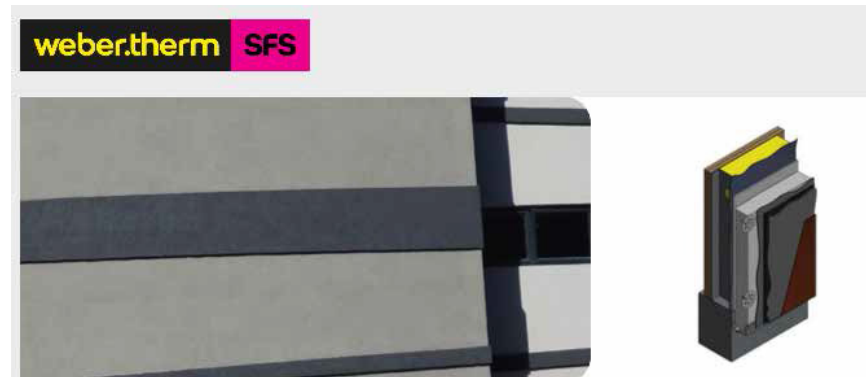
ETICS PRODUCT INFORMATION



The system is designed by Weber in conjunction with Specifiers on a project specific basis. The installation of the system is carried out by installers who have been trained and accredited by Weber. Weber offers a ten-year materials guarantee, subject to certain terms and conditions. The Contractor offers a workmanship guarantee in accordance with the NHBRC. All system components shall be supplied by Weber unless specifically otherwise agreed.

USE:

The systems are for use as external insulation on commercial and residential buildings, which are designed in accordance with the general building regulations.



GENERAL MANUFACTURE, SUPPLY AND INSTALLATION:

Weber is responsible for the specification of all systems components to Weber approved specs. Where products are manufactured by Weber, these components will be specified and used. Where components are outsourced – these will be in accordance with the Weber approved 'supplier' system. Weber accredited contractors are responsible for the installation of the specified systems, in accordance with Weber project specific 'Site Project Pack' including the Applications Guide.

04 MEMBERSHIPS

SABS (INCL. SANS 517)

SABS

SABS is a statutory body that was established in terms of the Standards Act, 1945 (Act No. 24 of 1945) and continues to operate in terms of the latest edition of the Standards Act, 2008 (Act No. 8 of 2008) as the national standardization institution in South Africa, mandated to:

Develop, promote and maintain South African National Standards (SANS).

Promote quality in connection with commodities, products and services.

Render conformity assessment services and assist in matters connected therewith.

SANS 517

SANS 517

The South African Building code specifically for Light Steel Frame Construction.

The latest version of the Light Steel Frame Building standard, SANS 517:2013, can be obtained from the SABS, or ordered from SASFA.

GREEN BUILDING COUNCIL



The Green Building Council South Africa leads the transformation of the South African property industry to ensure that buildings are designed, built and operated in an environmentally sustainable way.

Buildings are one of the main contributors to climate change. Building green is an opportunity to use resources efficiently and address climate change while creating healthier and more productive environments for people and communities.

NHBRC



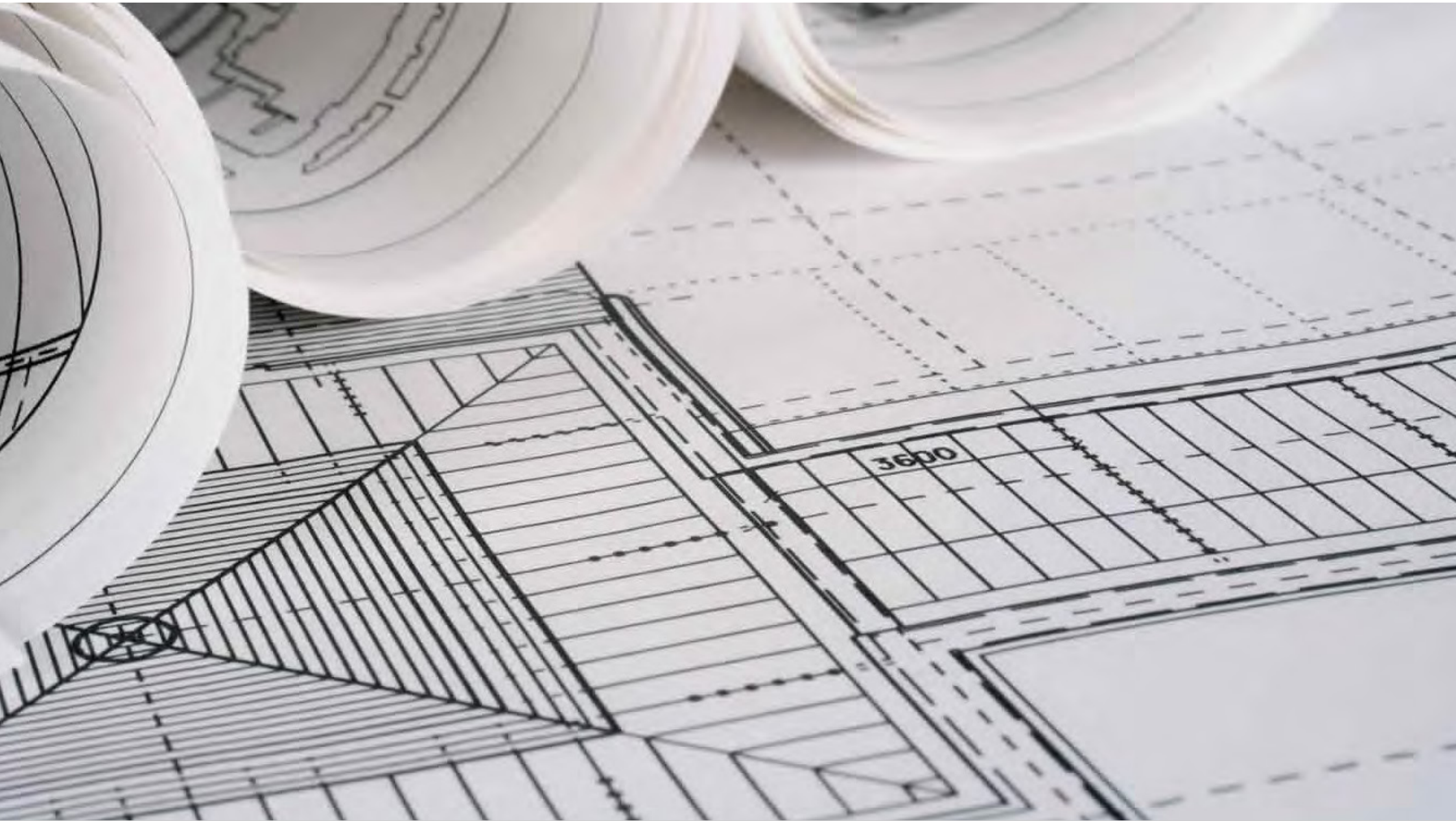
The National Home Builders Registration Council (NHBRC) is a regulatory body of the home building industry. Our goal is to assist and protect housing consumers who have been exposed to contractors who deliver housing units of substandard design, workmanship and poor quality material.

SASFA



Southern African Light Steel Frame Association, a division of the Southern African Institute of Steel Construction

TECHNICAL INFORMATION



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ABBREVIATIONS:

LSF	Light Steel Frame
c/c	Centre to Centre Oriented
SFH	Home
FC	Fibre Cement
ICF	Insulated Concrete Form
OPC	Ordinary Portland Cement
EPS	Expanded Polystyrene
UBS	Ultra Building System
DPC	Damp Proof Course
IBR	Inverted Box Rib
OSB/MGO	OSB, MGO and Fibre Cement Board are Used Interchangably and Refer to the Different Types of Boards Utilised by Futurecon

PLEASE NOTE:

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LIGHT STEEL FRAMES

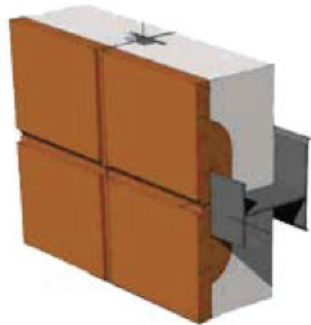
INTERIOR WALLS



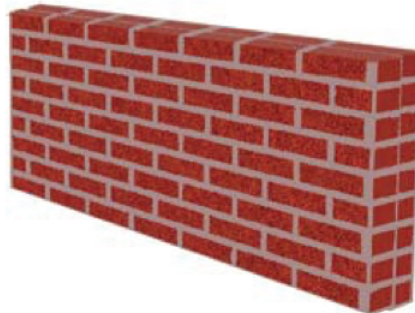
1
Internal Wall Details:
R-Value: 2.9
Overall Thickness: 130 mm
Fire Rating: 30 Minutes SABs Approved
Sound Insulation: 51 dB



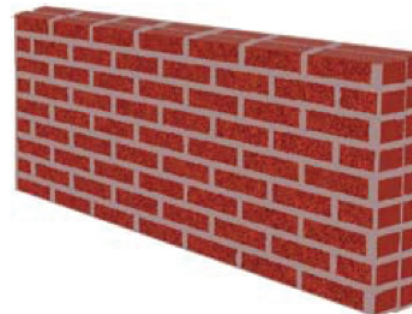
2
Internal Wall Details:
With 2 boards on both sides
R-Value: 3.07
Overall Thickness: 160 mm
Fire Rating: 120 Minutes SABs Approved
Sound Insulation: 53 dB



Silver Facade 3D



Standard Single Brick Wall:
R-Value: 0.18
Fire Rating: 30 Minutes
Sound Insulation: 45 dB



Standard Double Brick Wall:
R-Value: 0.26
Fire Rating: 60 Minutes
Sound Insulation: 49 dB

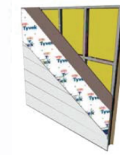
EXTERIOR WALLS



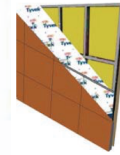
3
Standard LSF Wall Details:
R-Value: 3.69
Overall Thickness: 133 mm
Fire Rating: 30 Minutes SABs Approved
Sound Insulation: 52 dB



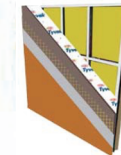
4
Solid Wall Details:
R-Value: 1.1
Overall Thickness: 110 mm
Fire Rating: 120 Minutes SABs Approved
Sound Insulation: 46 dB



8
Handy Plank Wall Detail:
R-Value: 2.8
Overall Thickness: 130 mm
Fire Rating: 30 Minutes SABs Approved
Sound Insulation: 46 dB



6
Silver Facade LFS Wall Detail:
R-Value: 5.3
Overall Thickness: 160 mm
Fire Rating: 30 Minutes SABs Approved
Sound Insulation: 52 dB



7
Express Joint System - Silver Panel:
R-Value: 2.8
Overall Thickness: 133 mm
Fire Rating: 60 Minutes SABs Approved
Sound Insulation: 52 dB

EXTERNAL WALLS



EXTERNAL WALL OPTIONS

EXAMPLES OF FINISHED WALLS



PLASTERED



CLADDED

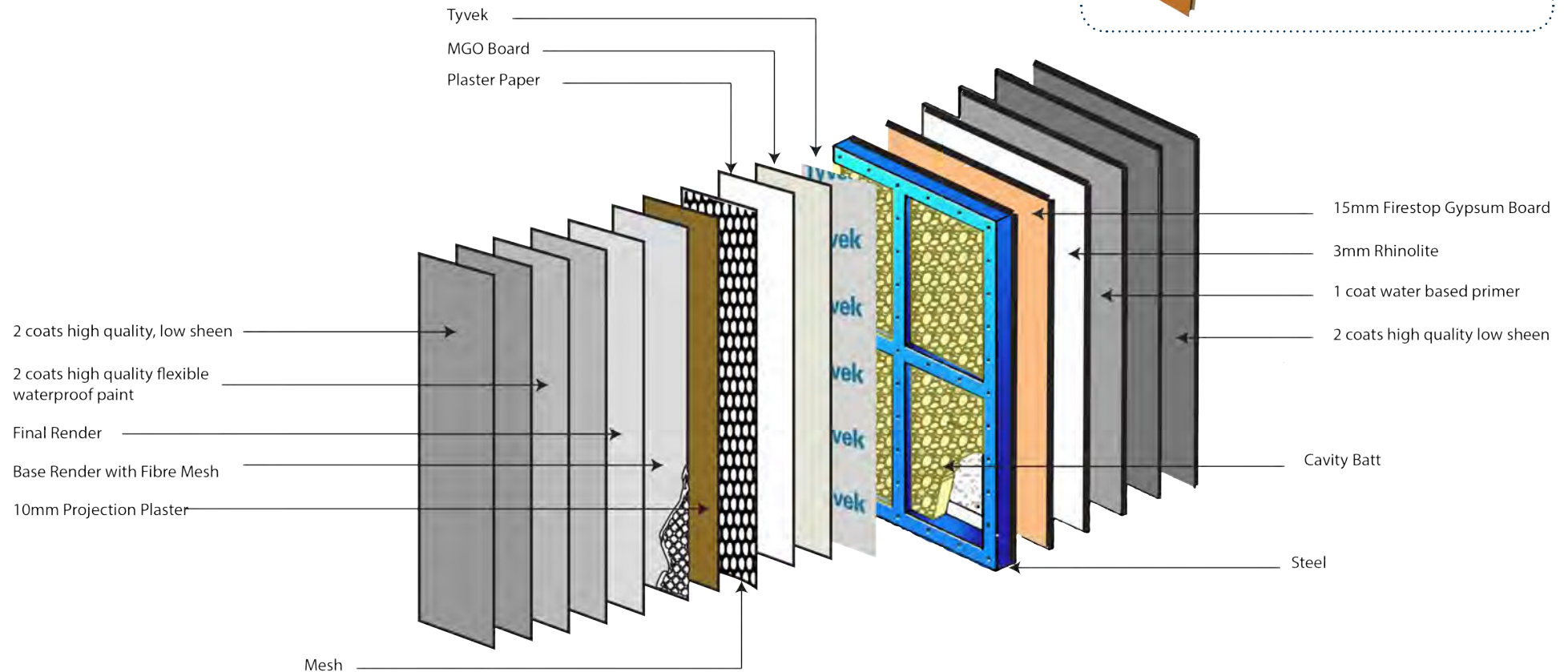
PLASTERED EXTERNAL WALLS

STANDARD EXTERNAL WALL PLASTER



STANDARD EXTERNAL WALL PLASTER WALL CONSTRUCTION DETAILS

	Overall Thickness:	133 mm
	Approximate Weight:	33 kg/m ²
	R-Value:	3.69
	Fire Rating:	60 Minutes
	Sound Insulation:	52dB



Fixture C
MGO to LSF Panel
Strongtie Cement Sheet Screws
CBSDG158SA – #8 x 4.2x42 mm

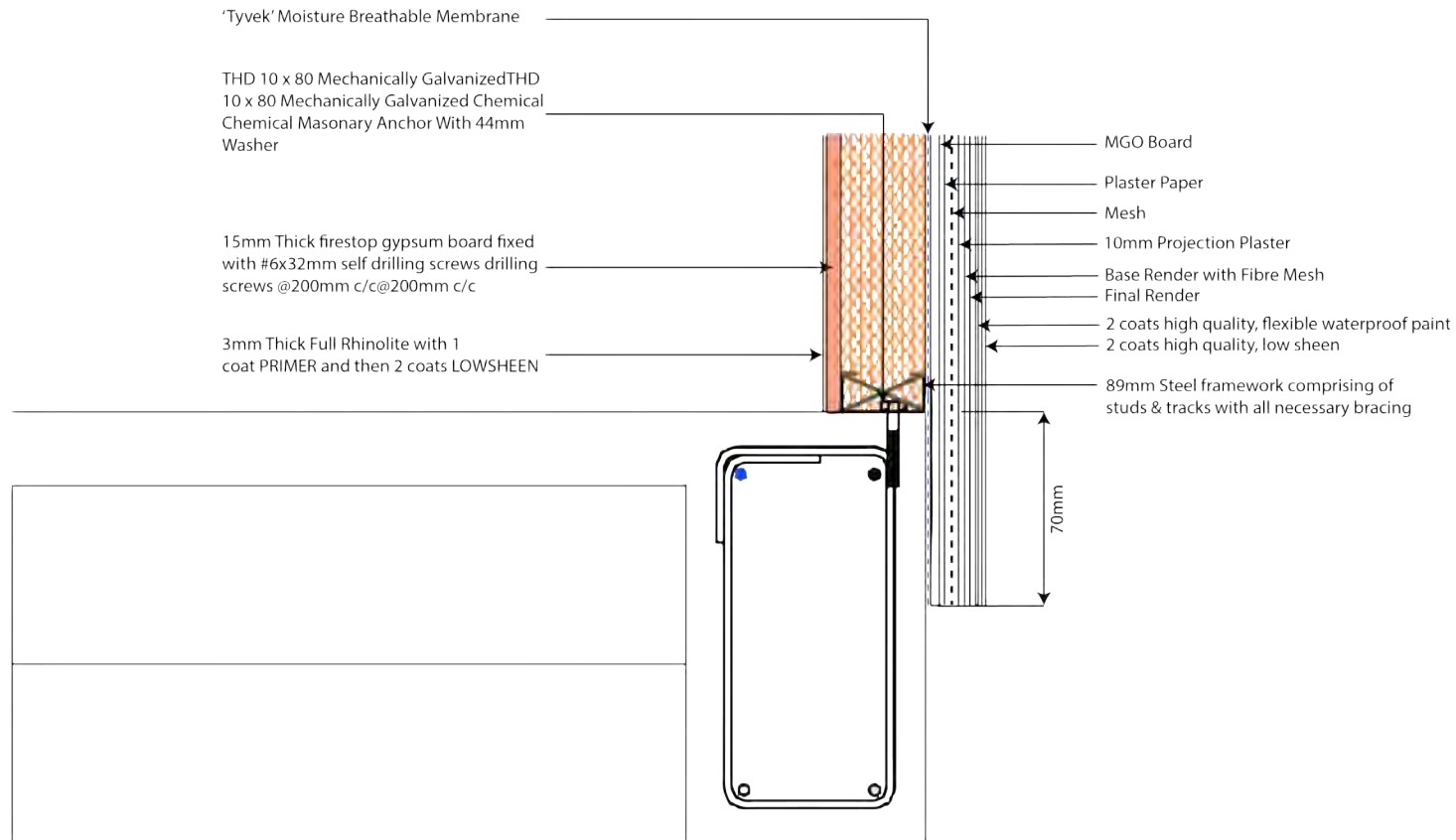


Fixture B
Gypsum to LSF Panel
Silver Plasterboard Screws
DWFS DG114PS – #6 x 32 mm



Fixture C
Mentex Mesh to MGO
Mild Steel Galvanised Staples
14 mm x 12.8 mm

STANDARD EXTERNAL WALL PLASTER WALL CONSTRUCTION DETAILS



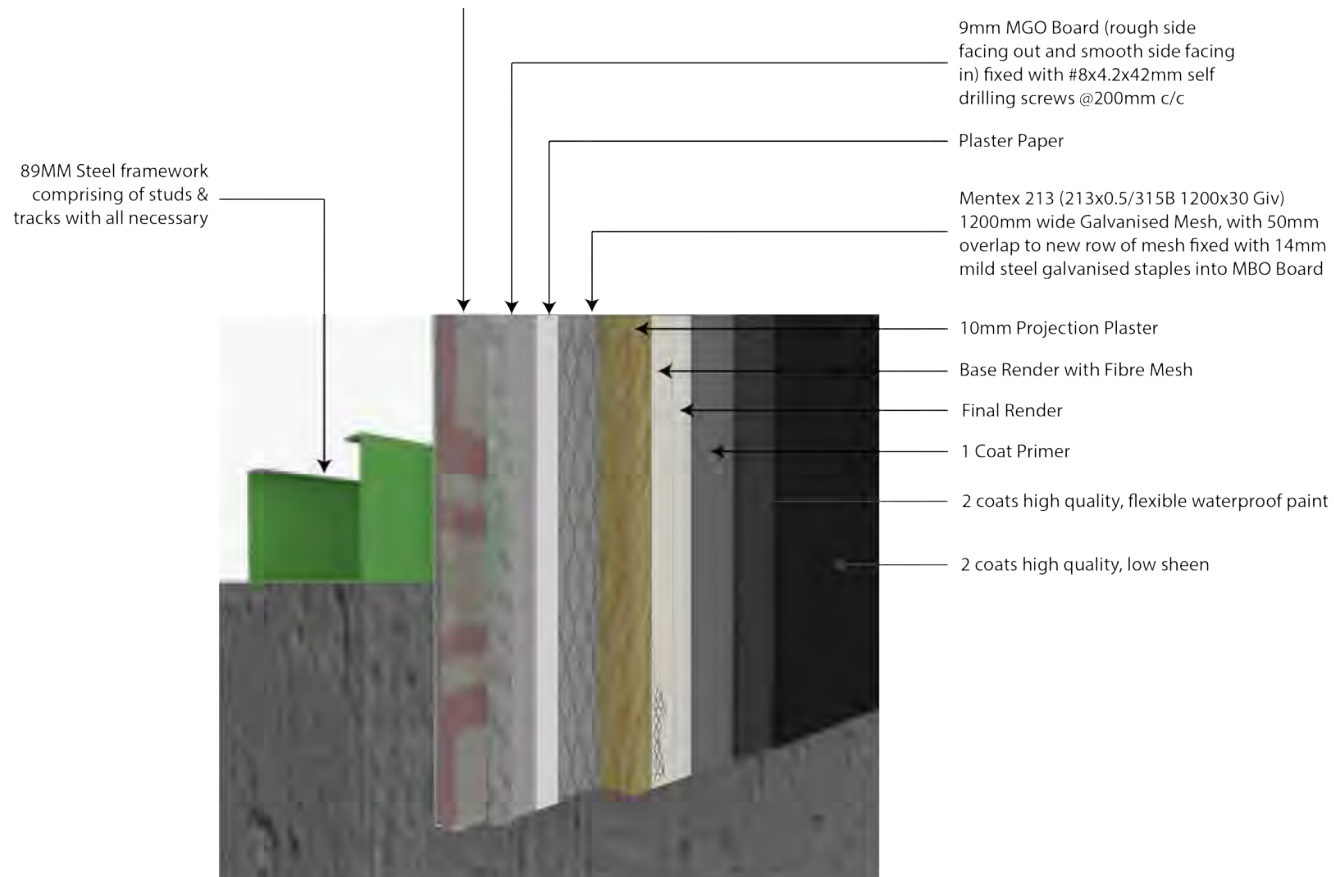
Fixture C
MGO to LSF Panel
Strongtie Cement Sheet Screws
CBSDG158SA – #8 x 4.2x42 mm



Fixture B
Gypsum to LSF Panel
Silver Plasterboard Screws
DWFSDG114PS – #6 x 32 mm

Reference: SGE-FN-001

STANDARD EXTERNAL WALL PLASTER WALL CONSTRUCTION DETAILS



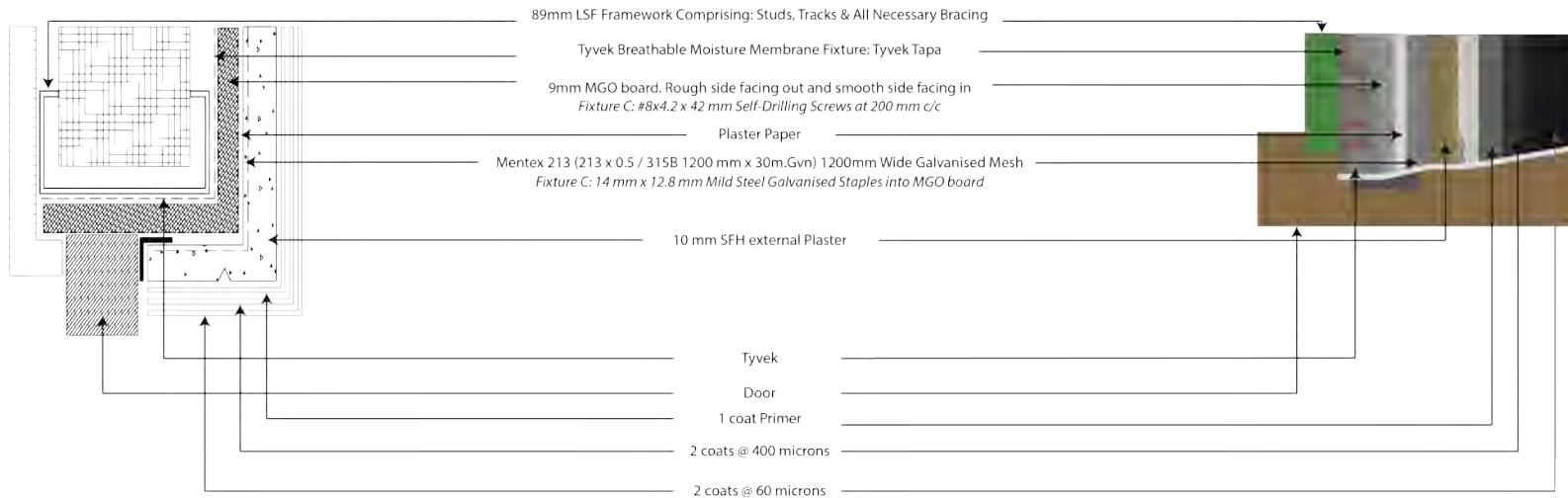
Fixture C
MGO to LSF Panel
Strongtie Cement Sheet Screws
CBSDG158SA – #8 x 4.2x42 mm



Fixture C
Mentex Mesh to MGO
Mild Steel Galvanised Staples
14 mm x 12.8 mm

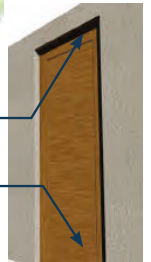
Reference: SGE-FN-001

STANDARD EXTERNAL WALL PLASTER WATERPROOFING: DOORS



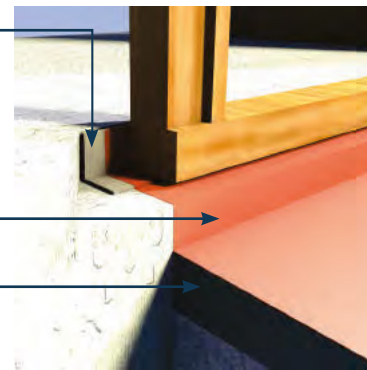
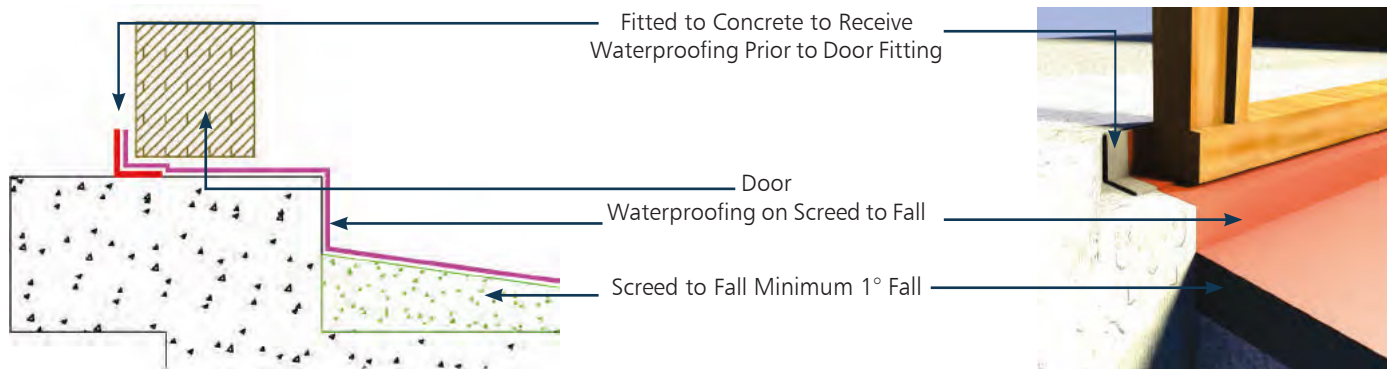
Waterproofing around
Top Door Opening

Waterproofing at Threshold
of Door Opening



Fixture C MGO to LSF Panel

Strongtie Cement Sheet Screws
CBSDG158SA – #8 x 4.2x42 mm

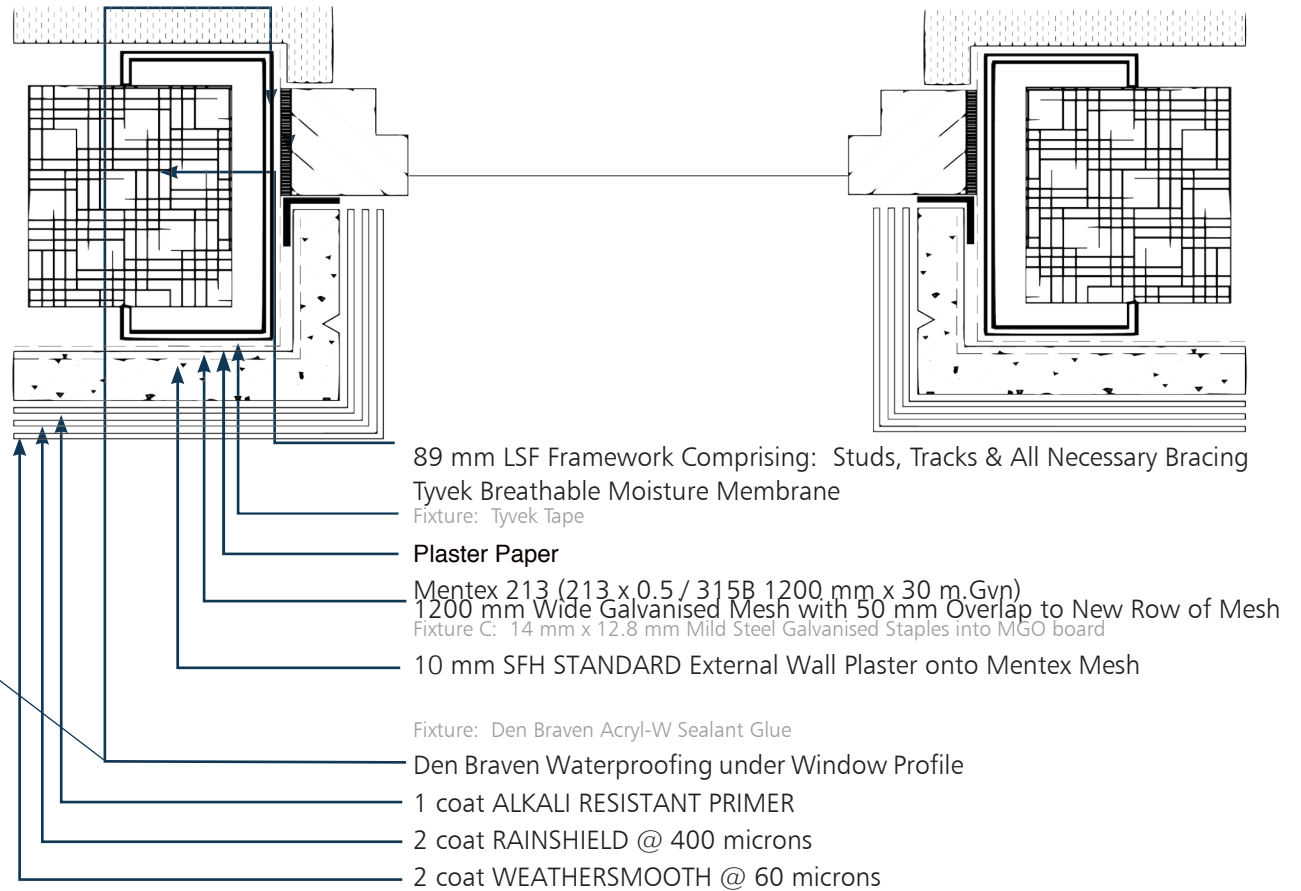


STANDARD EXTERNAL WALL PLASTER WATERPROOFING: WINDOWS




INSTALLATION SEQUENCE:

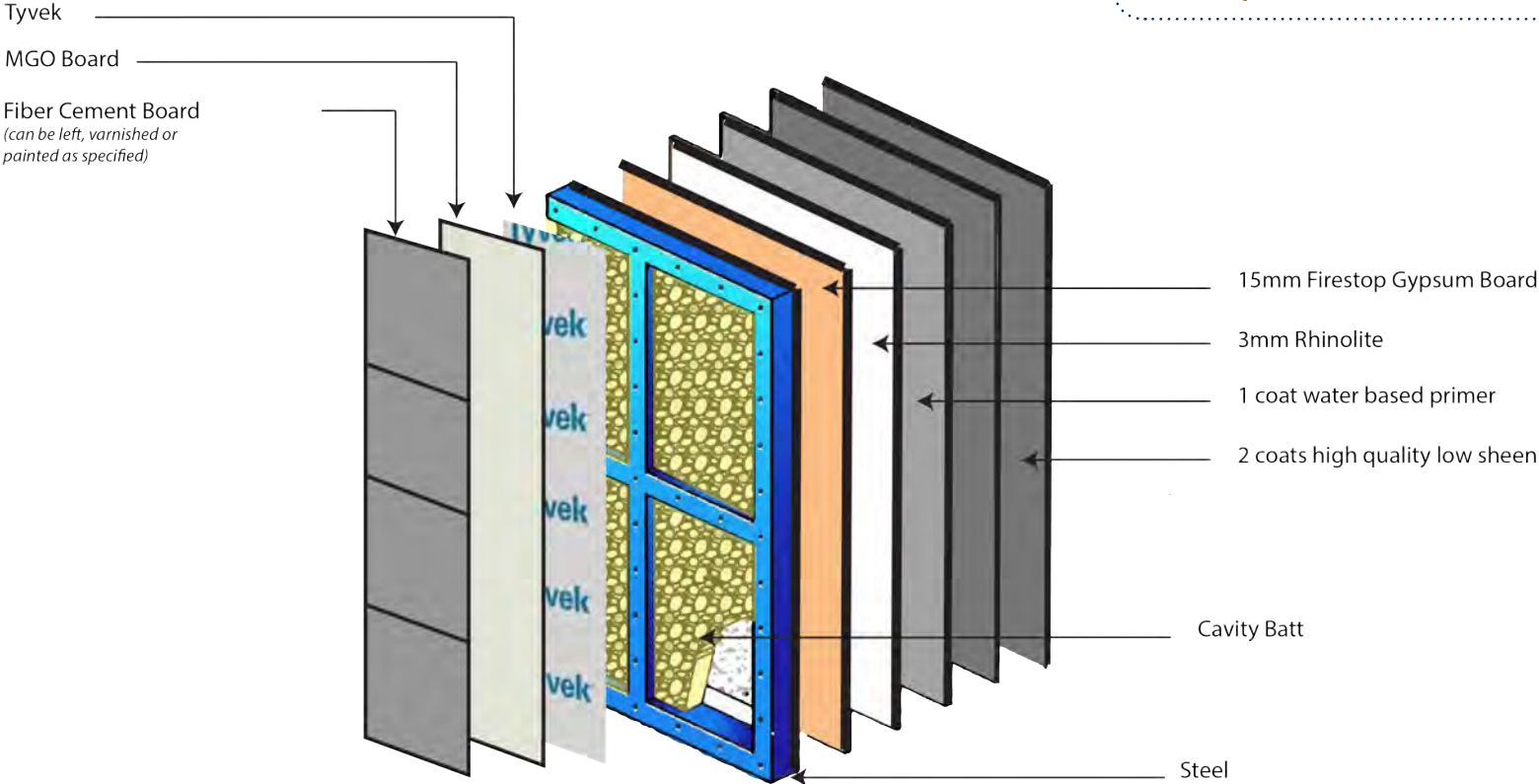
- Install Tyvek House Wrap using Tyvek Tape
- Install MGO board to LSF
- Install Plaster Paper
- Install Mentex 99 Galvanised Mesh
- Install Windows & Doors before External Plaster can Commence
- Waterproof Windows with Den Braven
- Apply 10 mm External Plaster
- Apply final Mesh and Render



STANDARD HANDY PLANKS CLADDED WALL WALL CONSTRUCTION DETAILS



Overall Thickness:	133 mm
Approximate Weight:	33 kg/m ²
R-Value:	3.69
Fire Rating:	60 Minutes
Sound Insulation:	52dB



Fixture C
MGO to LSF Panel
Strongtie Cement Sheet Screws
CBSDG158SA – #8 x 4.2x42 mm

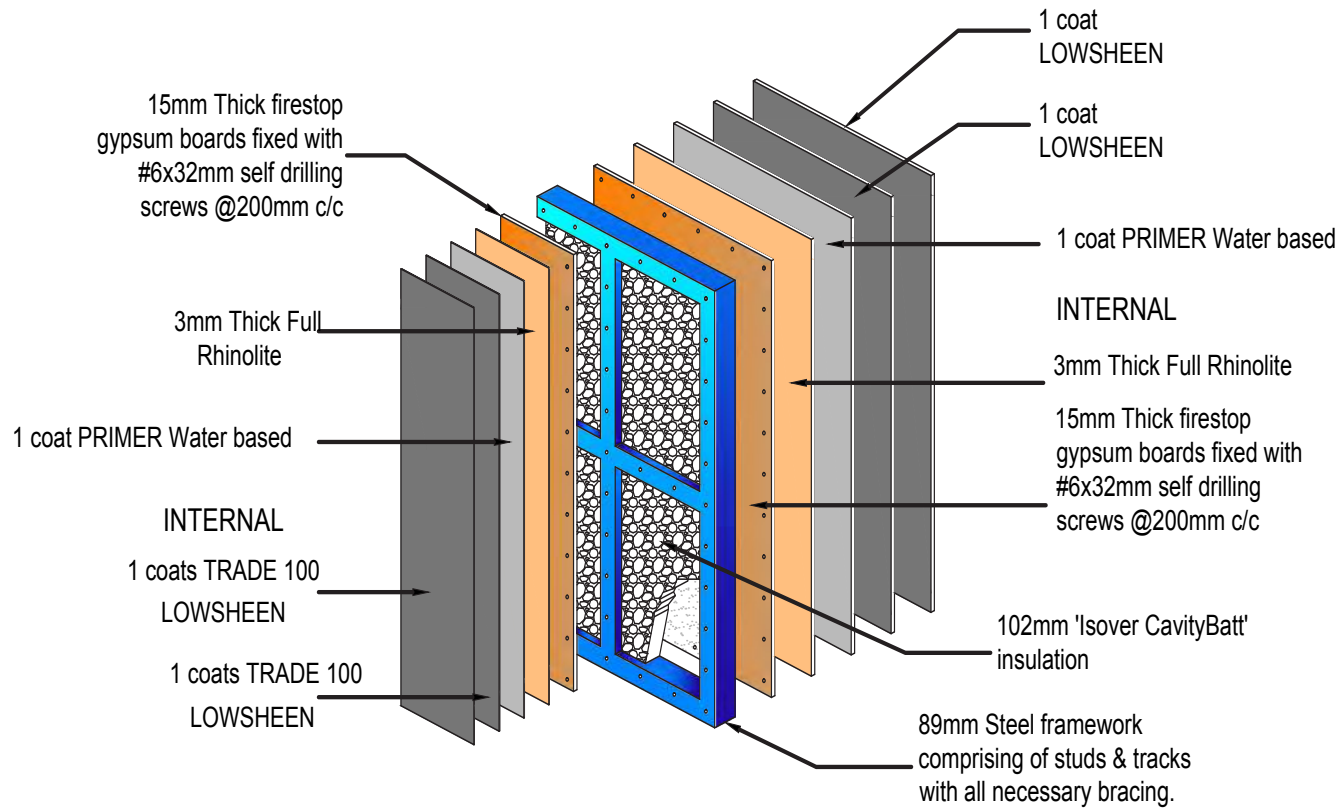


Fixture B
Gypsum to LSF Panel
Silver Plasterboard Screws
DWFS DG114PS – #6 x 32 mm

INTERNAL WALLS



ONE HOUR FIRE RATING WALL WALL CONSTRUCTION DETAILS



Fixture B
Gypsum to LSF Panel
Silver Plasterboard Screws
DWFSDG114PS – #6 x 32 mm

ONE HOUR FIRE RATING WALL

TECHNICAL SPECIFICATIONS

60 MINUTE FIRE RATED INTERNAL PARTITION SYSTEM:

- Non-Load Bearing Drywall System
- 15 mm Technical Fire Check Plasterboard – One Layer Each Side

APPLICATION:

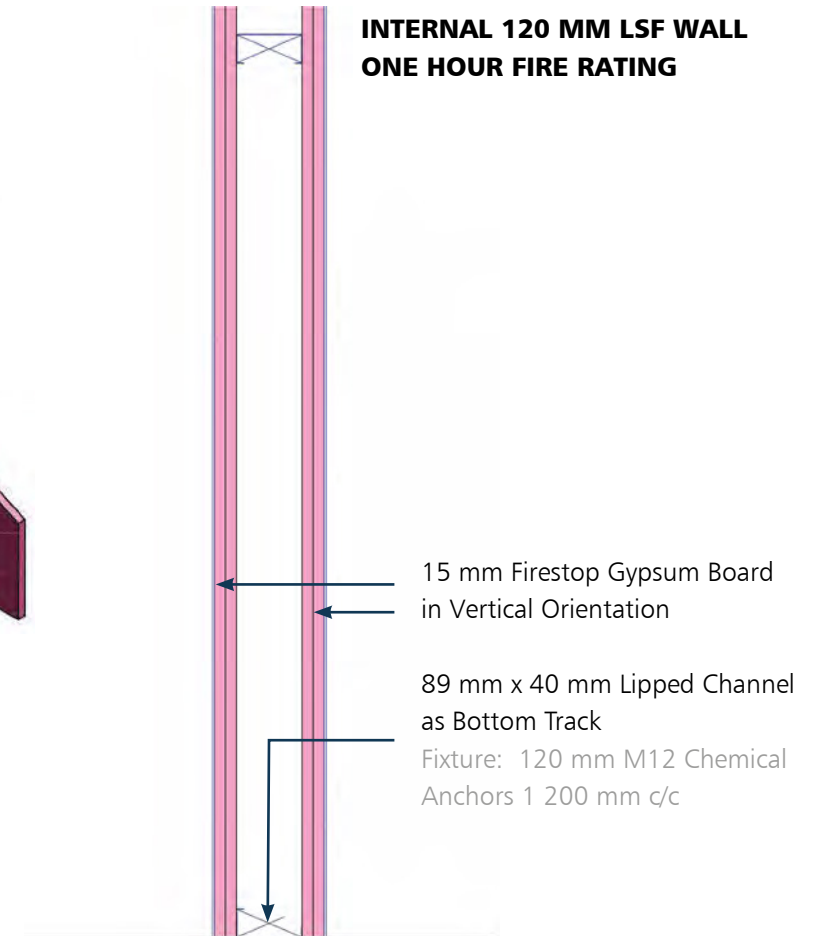
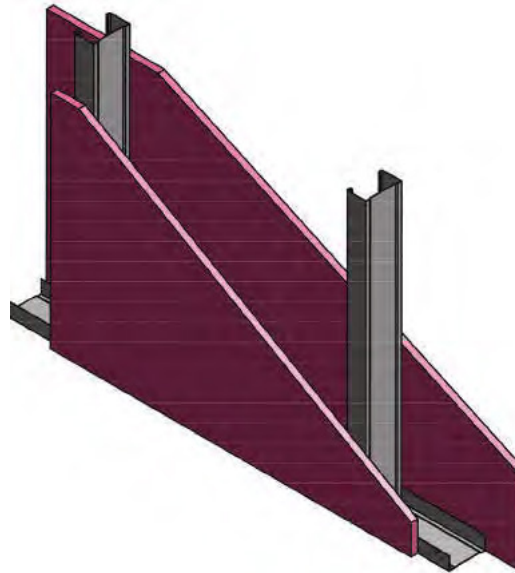
Commercial & Residential

MATERIAL USED:

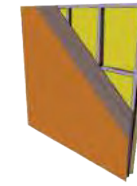
A: 89 mm LSF Steel Stud
B: 89 mm LSF Steel Track
C: 15mm Fire Check Plaster Board
32 mm Drywall Screws
Drywall Jointing System
Floor & Ceiling Finishes as per Specification

APPLICATION DETAILS:

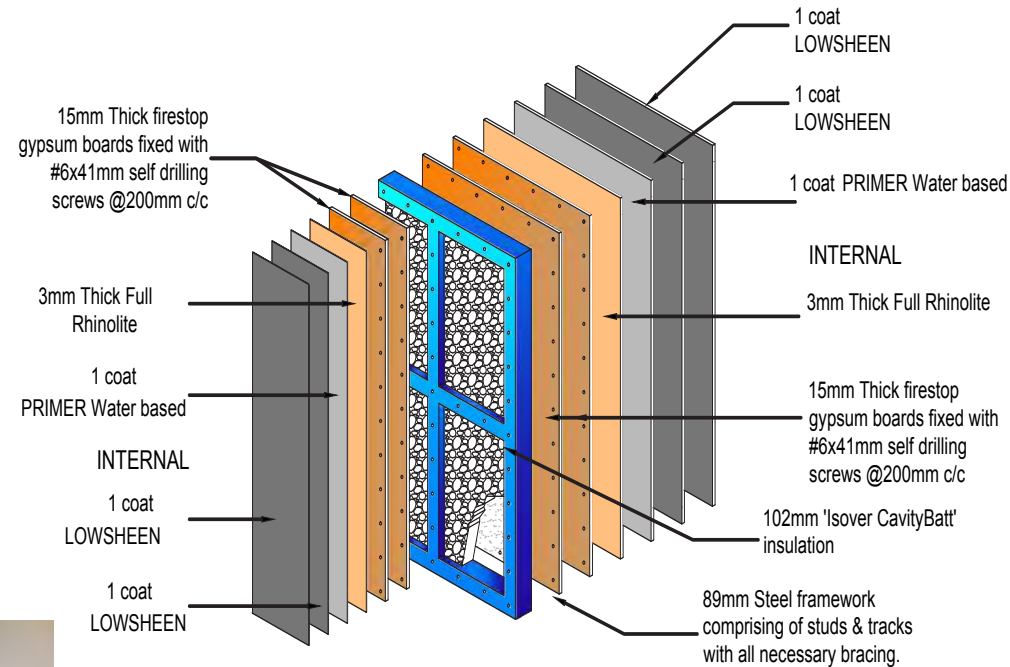
1. Set steel studs spaced at 600 mm centre to centre (c/c) into steel track at floor & ceiling.
2. Apply a single layer of 15 mm Technical Fire Check plasterboard vertical to both sides, using 32 mm drywall screws spaced at 200 mm c/c, stagger joints.
Taper edge plasterboard to each side using 32 mm drywall screws spaced at 220 mm c/c.
3. Apply tape & joint according to specification.
4. Acoustic performance requires sealing between track, floor, ceiling and any other abutment joints.
5. Stagger the plasterboard joints in the system.



TWO HOUR FIRE RATING WALL WALL CONSTRUCTION DETAILS



Overall Thickness:	160 mm
Approximate Weight:	45.5 kg / m ²
Weight: R-Value:	3.07
Fire Rating:	120 Minutes
Sound Insulation:	53 dB



Fixture F

Gypsum to LSF Panel

Black Plasterboard Screws
DW0641SD – #6 x 41 mm

TWO HOUR FIRE RATING WALL

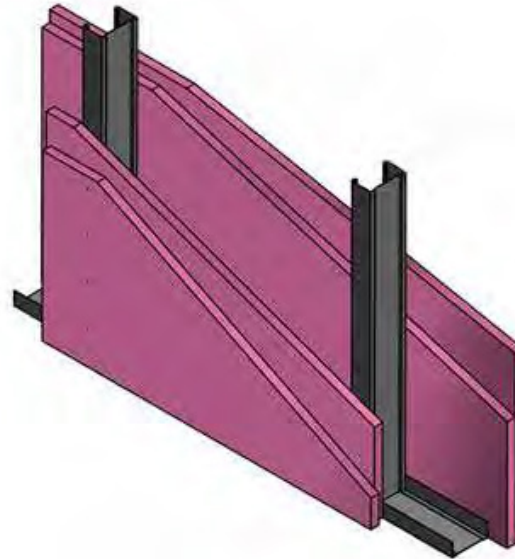
TECHNICAL SPECIFICATIONS

120 MINUTE FIRE RATED INTERNAL PARTITION SYSTEM:

- Non-Load Bearing Drywall System
- 15 mm Technical Fire Check Plasterboard – Double Layer Each Side

MATERIAL USED:

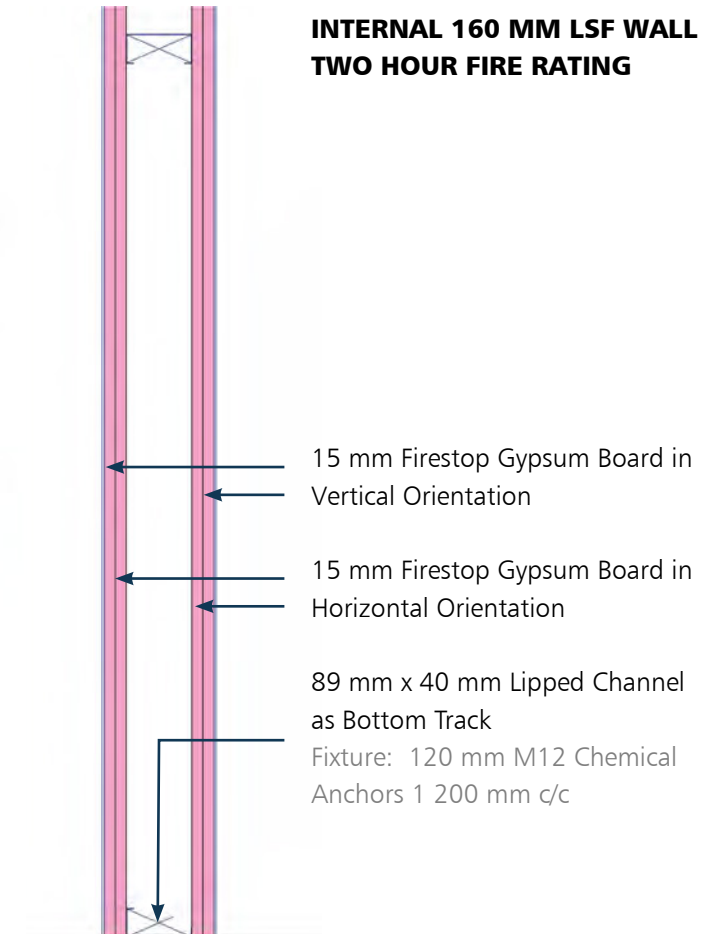
A: 89 mm LSF Steel Stud
B: 89 mm LSF Steel Track
C: 15mm Fire Check Plaster Board
32 mm & 42 mm Drywall Screws
Drywall Jointing System
Floor & Ceiling Finishes as per Specification



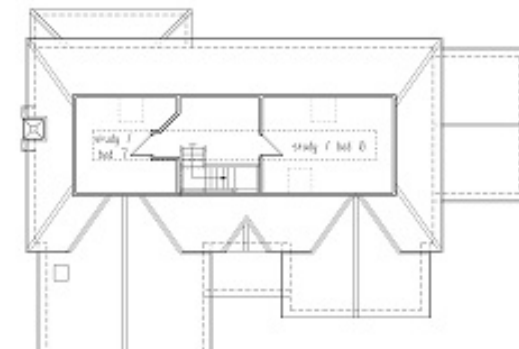
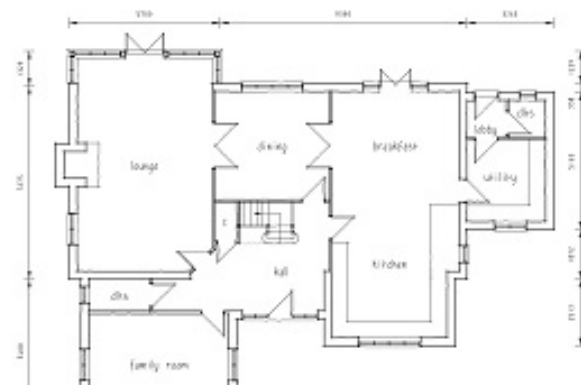
APPLICATION DETAILS:

1. Set steel studs spaced at 600 mm centre to centre (c/c) into steel track at floor & ceiling.
2. Apply a single layer of 15 mm Technical Fire Check plasterboard vertical to both sides, using 32 mm drywall screws spaced at 200 mm c/c, stagger joints.
3. Apply a face layer of 15 mm Technical Fire Check plasterboard horizontal to both sides, using 42 mm drywall screws spaced at 200 mm c/c, stagger joints.
4. Apply tape & joint according to specification.
5. Acoustic performance requires sealing between track, floor, ceiling and any other abutment joints.
6. Stagger the plasterboard joints in the system.
7. Maximum partition height is 4.5 m.

INTERNAL 160 MM LSF WALL TWO HOUR FIRE RATING



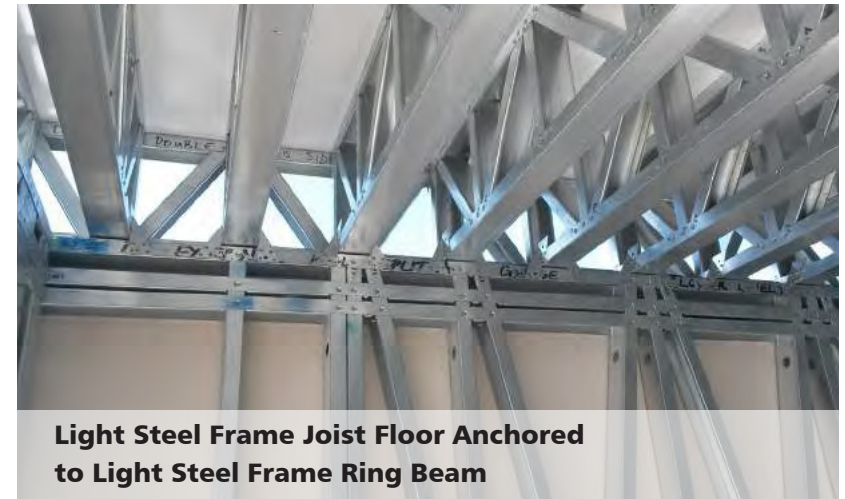
FLOORS



JOIST FLOORS CONSTRUCTION SAMPLES



Completed Suspended Light Steel Frame Joist Floor



**Light Steel Frame Joist Floor Anchored
to Light Steel Frame Ring Beam**



Light Steel Frame Ring Beam

JOIST FLOORS CONSTRUCTION SAMPLES



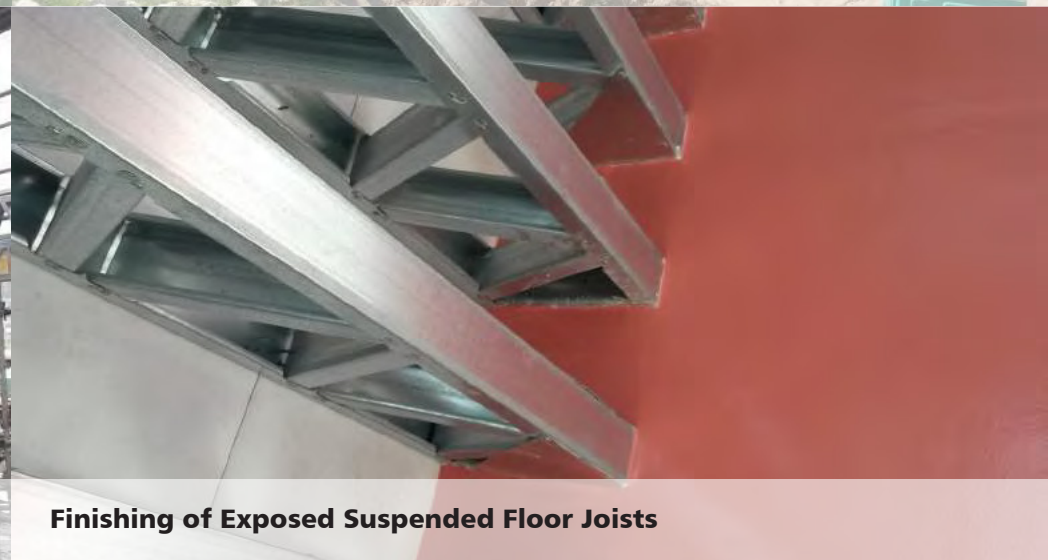
Installation of MGO Boards



Installation of LSF Wall on LSF Joist Floor

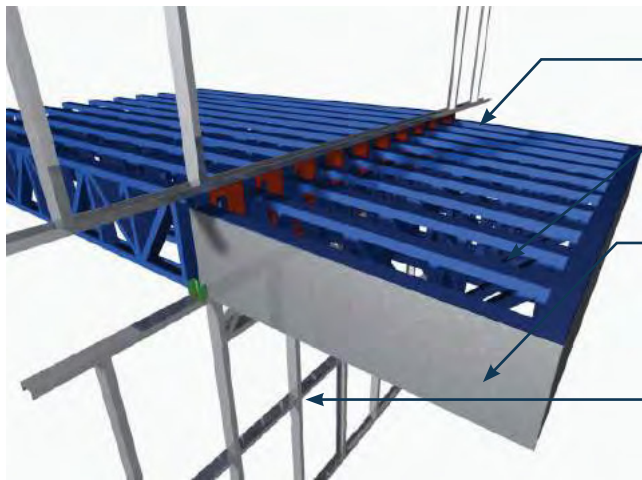


Suspended Joist Floor with Internal Cantilever



Finishing of Exposed Suspended Floor Joists

JOIST FLOORS CANTILEVERS



Light Steel Frame Joist Floor Balcony Cantilever

Light Steel Frame Filler Box

Fixture: #10 x 4.8x16 mm Wafer Head Screws

1.2 mm Galvanised Plate

Fixture: #10 x 4.8x16 mm Wafer Head Screws
Stitched to Light Steel Frame Joist Cantilever

Light Steel Frame Wall Panel

NOTE:

- External Cantilevers Minimum Step: 75 mm
- External Cantilevers Minimum Slope: 1°
- Cantilevers Maximum Supported Span: 1 500 mm



JOIST FLOORS CANTILEVERS

Anchoring a LSF Cantilever to a LSF Wall Panel using Hurricane Bracket



To prevent any toppling & water penetrating the structure, filler panels must be installed.
Filler panels to be installed using FrameCAD Tri-Fix Brackets.



JOIST FLOORS: MGO BOARDS/OSB/FIBRE CEMENT BOARDS CONSTRUCTION DETAILS

15mm MGO board Rough side facing out and smooth side facing in

Fixture D: #10 x 4.9x42mm mm Self-Drilling Screws at 150 mm c/c

250 Micron DPC

Light Steel Frame Joist at 300 mm c/c



Fixture D Floor Screw

Strongtie Cement Sheet Screws
CBSDGL114SA – #10 x 4.9x42 mm
Light Steel Frame Joist

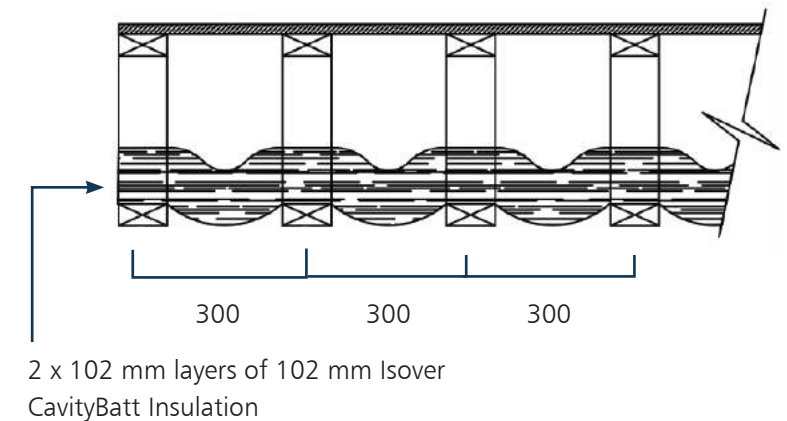
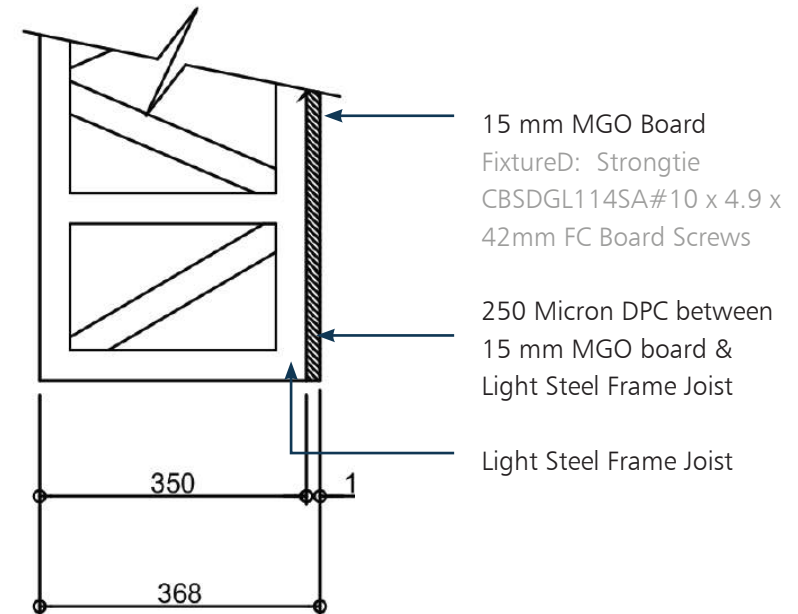
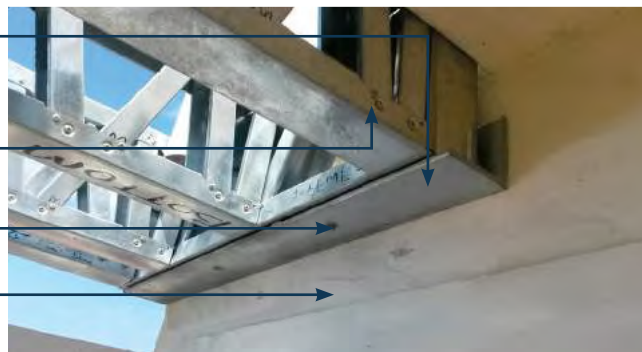
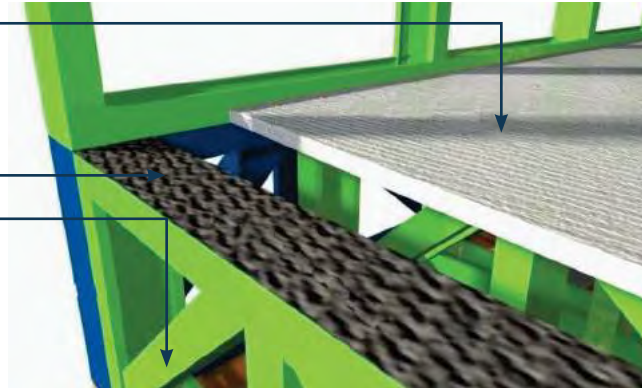
2x 102mm layers Isover CavityBatt
Insulation &
Sound Seal

100 mm x 100 mm x 8 mm
Galvanised Angle

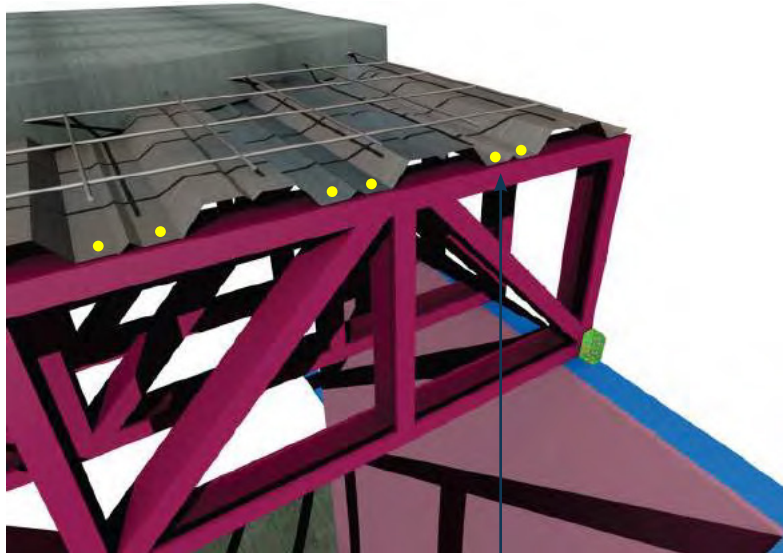
Light Steel Frame Joist

M12 Bolt Through

Existing Masonry Wall

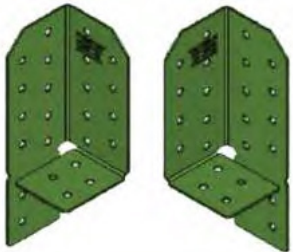


JOIST FLOORS: STRUCTURAL CONCRETE CONSTRUCTION DETAILS



Total Thickness of Floor: 430 mm

FRAMECAD TRI-FIX BRACKET



80 mm 25 Mpa Structural Concrete

Reference 193 Reinforcing Mesh

0.5 mm Galvanised IBR Sheet

Fixture: 4.8x16 mm Wafer Head Screws to the LSF Joist

50 micron DPC between IBR Sheet & Floor Joist

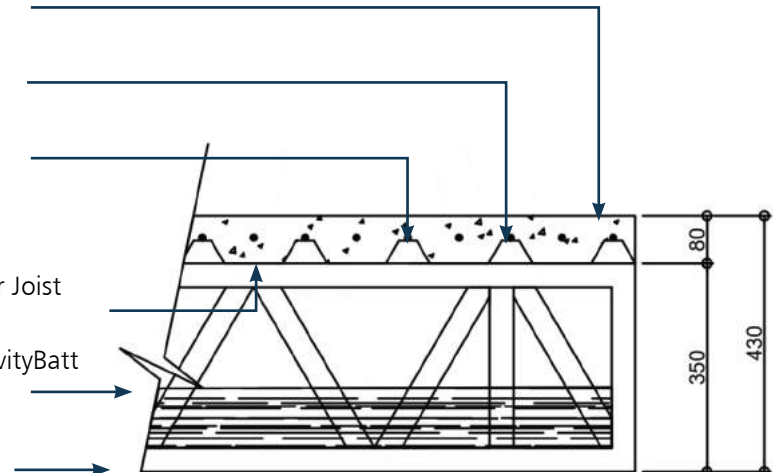
2 x layer of 102mm layers 102 mm Isover CavityBatt Insulation

Light Steel Frame Floor Joist

Fixture: 4.8x16 mm Wafer Head Screw & Hurricane bracket to the LSF Wall Panel

Light Steel Frame Wall Panel

Kare Industries Wafer Head Screws
SD1016W3CL2 4.8x16 mm



Joist to Wall Panel

Kare Industries Wafer Head Screws
SD1016W2Z3FP 4.8x16 mm



IBR to Joist

Kare Industries Wafer Head Screws
SD1016W2Z3FP 4.8x16 mm



SUSPENDED LIGHT STEEL FRAME JOIST FLOOR WITH STRUCTURAL CONCRETE



SUSPENDED LIGHT STEEL FRAME JOIST FLOOR WITH STRUCTURAL CONCRETE



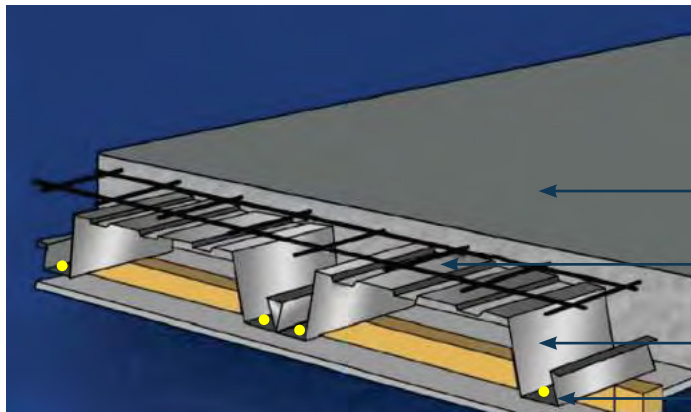
JOIST FLOORS: VOIDCON CONCRETE SLABS

VOIDCON STEEL DECKING SYSTEM

The Voidcon Steel Decking System is a composite suspended slab system, which is suitable for industrial, business and private structures.

Galvanized steel profiles are laid in position, whereafter concrete is poured inside the profiles.

- Concrete Provides Strength
- Steel Provides Stability
- Less Concrete than Customary Decking Systems
- Substantial Cost Savings



Voidcon Floor

Reinforced Concrete

Reinforcing

Voidcon Profile

Kare Industries Wafer Head
Screws

SD1016W3CL2 4.8x16 mm **Integrated Ring Beam**

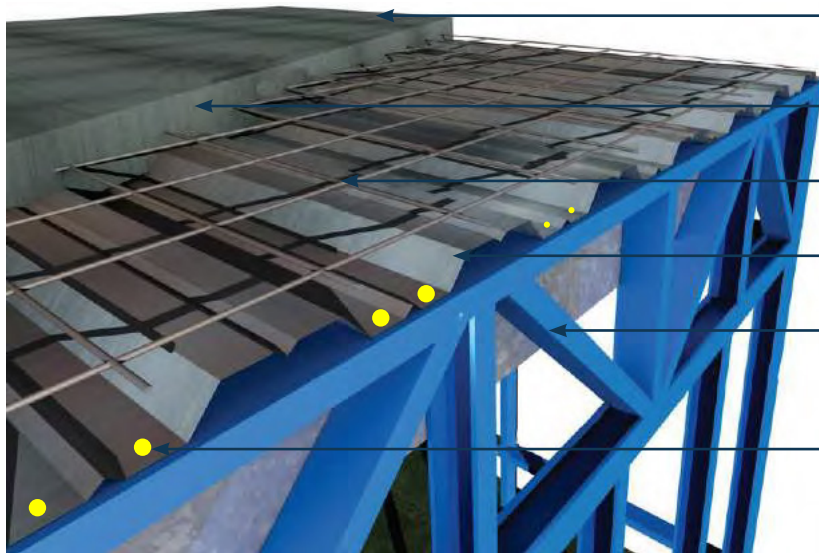
Three Outstanding Features:

- **Permanent Decking:** Provides a straightforward interlocking deck to help mass wet concrete & other construction loads
- **Composite Action:** Not only acts as permanent shuttering, but serves as tensile support, bringing about a composite activity with the concrete
- **T-Beam System:** The profile is based on a T-Beam System that gives beams & voids a large reduction in in-situ concrete volumes



JOIST FLOORS: VOIDCON CONCRETE SLABS

CONSTRUCTION DETAILS



Depth of Concrete must be between 170 mm & 300 mm, as per Engineer's Specifications.

25 Mpa Fibre Reinforced Concrete

Reference 193 Reinforcing Mesh

Voidcon Galvanised Profile Sheetting

Integrated Ring Beam

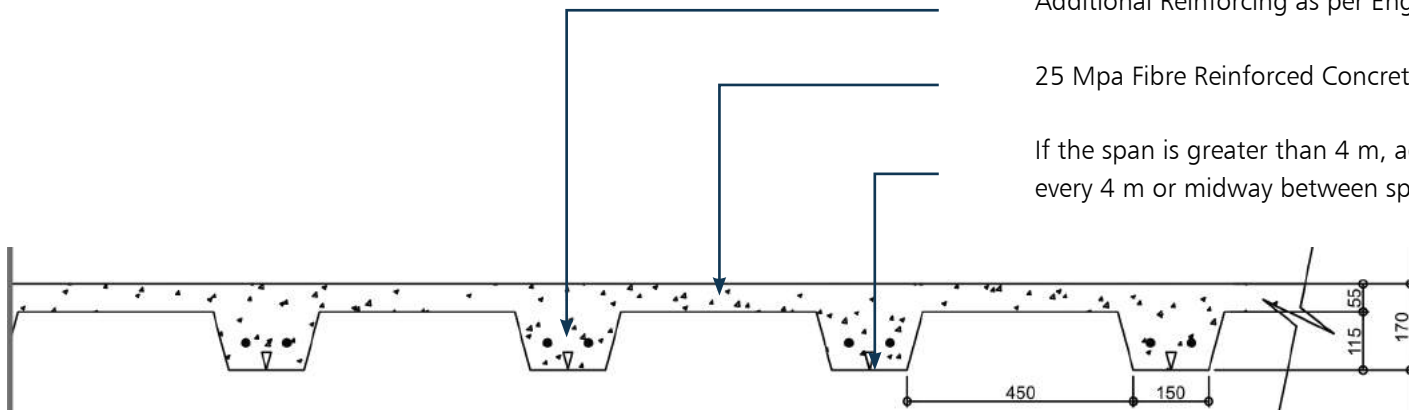
Kare Industries Wafer Head Screws
SD1016W2Z3FP 4.8x16 mm

Total Floor Thickness: 170 mm

Additional Reinforcing as per Engineer's Specifications

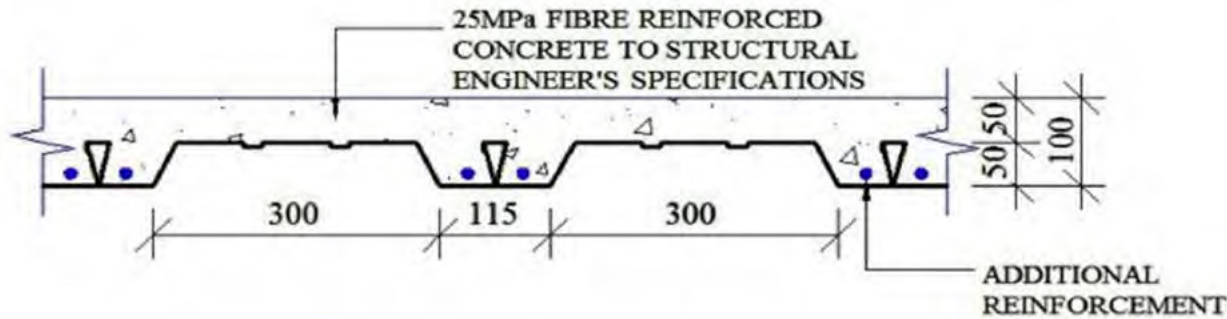
25 Mpa Fibre Reinforced Concrete as per Engineer's Specifications

If the span is greater than 4 m, additional propping must be inserted every 4 m or midway between spans smaller than 8 m



JOIST FLOORS: VOIDCON CONCRETE SLABS

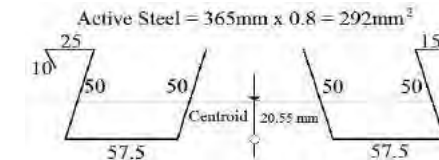
DESIGN TABLES: 100 MM SLAB



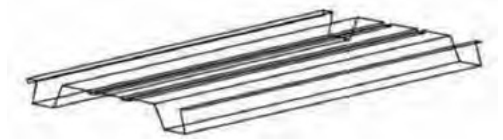
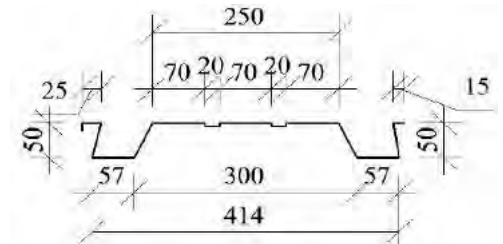
	Area of Reinforcement $f_y = 230\text{N/mm}^2$ $f_y = 450\text{N/mm}^2$	Moment of Resistance $M_r =$ $0.87 \times f_y \times A_{s_x}$	Total Factored Uniformly Distributed Superimposed Load					
			1.5kN/m ² $W_u =$	2.5kN/m ² $W_u =$	3.0kN/m ² $W_u =$	4.0kN/m ² $W_u =$	5.0kN/m ² $W_u =$	7.5kN/m ² $W_u =$
			5.41	7.01	7.81	9.41	11.01	15.01
VP 50 only	292	10.278	3.90	3.43	3.25	2.96	2.73	2.34
+ 1xY8	50.3	14.727			3.89	3.54	3.27	2.80
+ 1xY10	78.5	16.669					3.48	2.98
+ 2xY8	101	18.219						3.12
+ 1xY12	113	19.045						3.19
+ 2xY10	157	22.075						3.43
Maximum Span (L) in m								

Design Parameters and Assumptions

- Steel : 0.8mm ISQ230 (Galv. Z275)



- Concrete volume : 0.07m³/m²
- Temporary propping to be at 2m centers.
- Deflections are not calculated but are controlled by restricting the span to effective depth ratios in accordance with the Code of Practice.
- N.B.** All tabulated values serve as a guide only, and should be certified and approved by a civil/structural engineer.

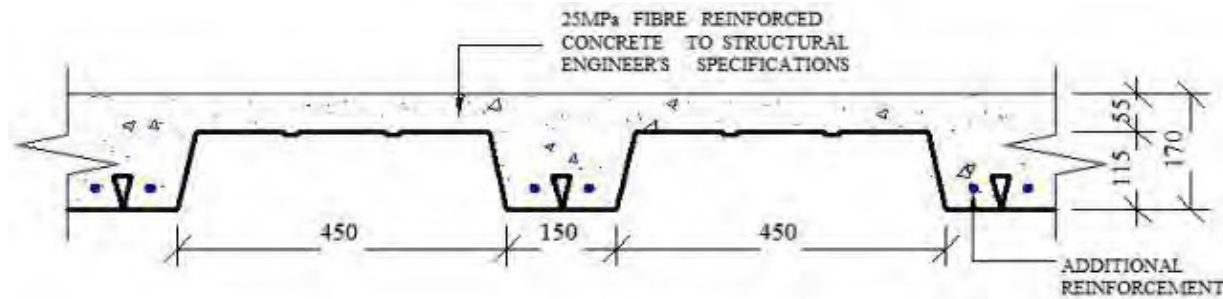


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JOIST FLOORS: VOIDCON CONCRETE SLABS

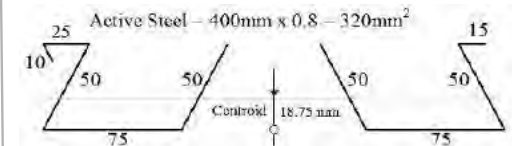
DESIGN TABLES: 170 MM SLAB



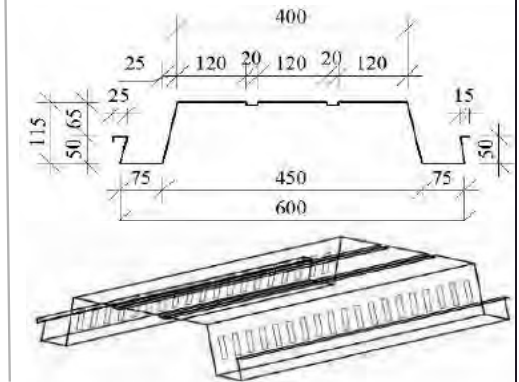
	Area of Reinforcement $f_y = 230\text{N/mm}^2$ $f_y = 450\text{N/mm}^2$	Moment of Resistance $M_r = 0.87 \times f_y \times A_s \times z$	Total Factored Uniformly Distributed Superimposed Load					
			1.5kN/m ² $W_u =$	2.5kN/m ² $W_u =$	3.0kN/m ² $W_u =$	4.0kN/m ² $W_u =$	5.0kN/m ² $W_u =$	7.5kN/m ² $W_u =$
VP 115 only	320	15.261	4.50	4.00	3.81	3.49	3.24	2.79
+ 1xY8	50.3	19.954	5.15	4.57	4.35	3.99	3.70	3.20
+ 1xY10	78.5	22.586	5.47	4.87	4.63	4.24	3.94	3.40
+ 2xY8	101	24.685		5.09	4.84	4.44	4.12	3.55
+ 1xY12	113	25.805		5.20	4.95	4.54	4.21	3.63
+ 2xY10	157	29.910			5.33	4.88	4.54	3.91
+ 1xY16	201	34.016				5.21	4.84	4.17
+ 2xY12	226	36.348				5.38	5.00	4.31
+ 3xY10	236	37.282					5.06	4.37
+ 3xY12	339	46.892						4.90
+ 2xY16	402	52.771						5.20
Maximum Span (L) in m								

Design Parameters and Assumptions

- Steel : 0.8mm ISQ230 (Galv. Z275)



- Concrete volume : 0.09m³/m²
- Temporary propping to be at 2m centers.
- Deflections are not calculated but are controlled by restricting the span to effective depth ratios in accordance with the Code of Practice.
- N.B.** All tabulated values serve as a guide only, and should be certified and approved by a civil/structural engineer.

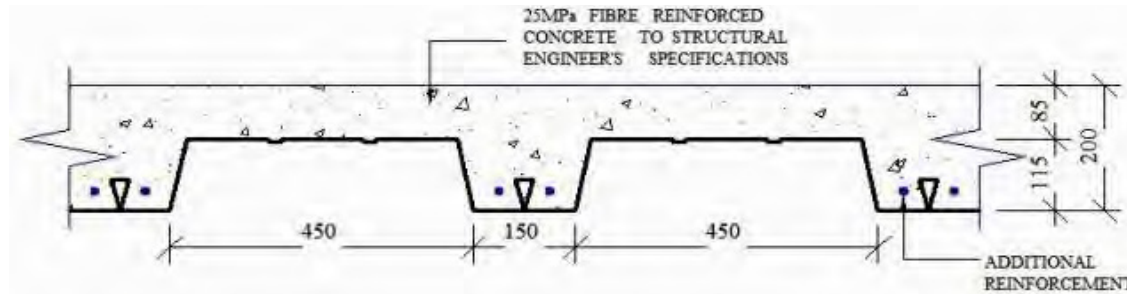


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JOIST FLOORS: VOIDCON CONCRETE SLABS

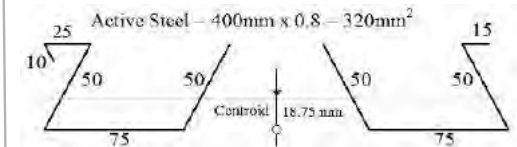
DESIGN TABLES: 200 MM SLAB



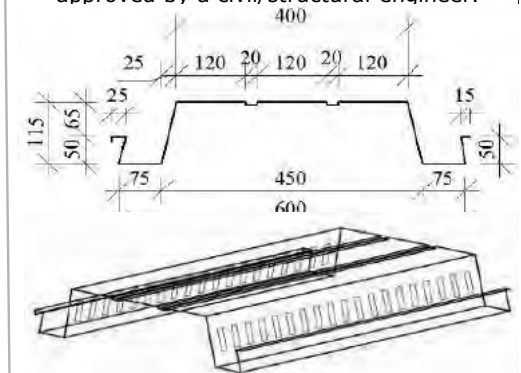
	Area of Reinforcement $f_y = 230\text{N/mm}^2$ $f_y = 450\text{N/mm}^2$	Moment of Resistance $M_r = 0.87 f_y x A_s x z$	Total Factored Uniformly Distributed Superimposed Load					
			1.5kN/m ² $W_u =$	2.5kN/m ² $W_u =$	3.0kN/m ² $W_u =$	4.0kN/m ² $W_u =$	5.0kN/m ² $W_u =$	7.5kN/m ² $W_u =$
			6.89	8.49	9.29	10.89	11.63	15.63
VP 115 only	320	18.356	4.62	4.16	3.97	3.67	3.55	3.07
+ 1xY8	50.3	24.001	5.28	4.75	4.55	4.20	4.06	3.50
+ 1xY10	78.5	27.166	5.61	5.06	4.84	4.47	4.32	3.73
+ 2xY8	101	29.691	5.87	5.29	5.06	4.67	4.52	3.90
+ 1xY12	113	31.038	6.00	5.41	5.17	4.77	4.62	3.99
+ 2xY10	157	35.976	6.46	5.82	5.56	5.14	4.97	4.29
+ 1xY16	201	40.914		6.21	5.93	5.48	5.31	4.58
+ 2xY12	226	43.720		6.42	6.13	5.67	5.48	4.73
+ 3xY10	236	44.842			6.21	5.74	5.55	4.79
+ 3xY12	339	56.402				6.44	6.23	5.37
+ 2xY16	402	63.472					6.61	5.70
+ 4xY12	452	69.084						5.95
			Maximum Span (L) in m					

Design Parameters and Assumptions

- Steel : 0.8mm ISQ230 (Galv. Z275)



- Concrete volume : 0.12m³/m²
- Temporary propping to be at 1,75m centers.
- Deflections are not calculated but are controlled by restricting the span to effective depth ratios in accordance with the Code of Practice.
- N.B.** All tabulated values serve as a guide only, and should be certified and approved by a civil/structural engineer.

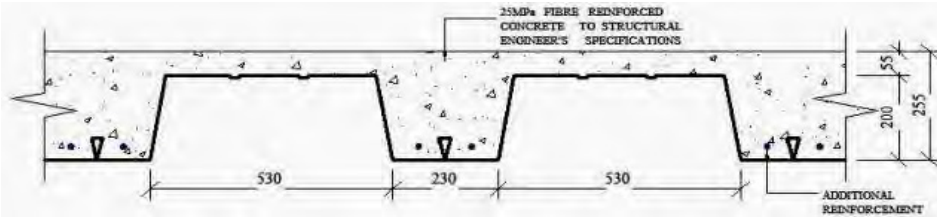


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JOIST FLOORS: VOIDCON CONCRETE SLABS

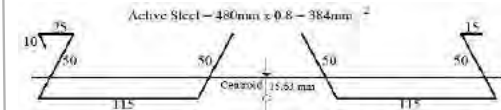
DESIGN TABLES: 255 MM SLAB



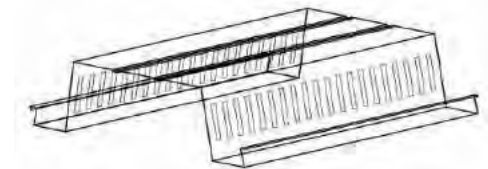
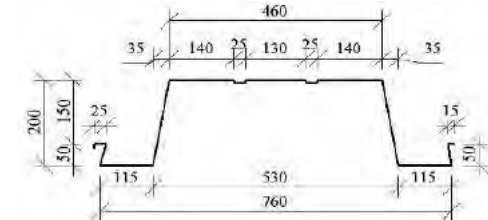
	Area of Reinforcement $f_y = 230\text{N/mm}^2$ $f_y = 450\text{N/mm}^2$	Moment of Resistance $M_r = 0.87 \times f_y \times A_s \times z$	Total Factored Uniformly Distributed Superimposed Load					
			1.5kN/m ² $W_u = 7.07$	2.5kN/m ² $W_u = 8.67$	3.0kN/m ² $W_u = 9.47$	4.0kN/m ² $W_u = 11.07$	5.0kN/m ² $W_u = 12.67$	7.5kN/m ² $W_u = 16.67$
VP 200 only	384	22.950	5.09	4.60	4.40	4.07	3.81	3.32
+ 1xY8	50.3	28.832	5.71	5.16	4.93	4.56	4.27	3.72
+ 1xY10	78.5	32.130	6.03	5.44	5.21	4.82	4.50	3.93
+ 2xY8	101	34.761	6.27	5.66	5.42	5.01	4.68	4.08
+ 1xY12	113	36.164	6.40	5.78	5.53	5.11	4.78	4.17
+ 2xY10	157	41.309	6.84	6.17	5.91	5.46	5.11	4.45
+ 1xY16	201	46.454	7.25	6.55	6.26	5.79	5.42	4.72
+ 2xY12	226	49.378	7.47	6.75	6.46	5.97	5.58	4.87
+ 3xY10	236	50.547	7.56	6.83	6.53	6.04	5.65	4.92
+ 3xY12	339	62.591	8.41	7.60	7.27	6.72	6.29	5.48
+ 2xY16	402	69.958		8.03	7.69	7.11	6.65	5.79
+ 4xY12	452	75.805			8.00	7.40	6.92	6.03
+ 3xY16	603	93.462				8.22	7.68	6.70
+ 2xY20	628	96.386					7.80	6.80
			Maximum Span (L) in m					

Design Parameters and Assumptions

- Steel : 0.8mm ISQ230 (Galv. Z275)



- Concrete volume : 0.12m³/m²
- Temporary propping to be at 2m centers.
- Deflections are not calculated but are controlled by restricting the span to effective depth ratios in accordance with the Code of Practice.
- N.B.** All tabulated values serve as a guide only, and should be certified and approved by a civil/structural engineer.

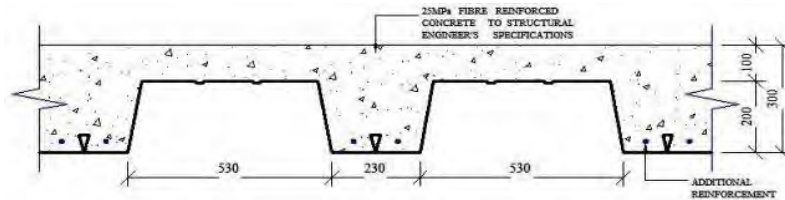


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JOIST FLOORS: VOIDCON CONCRETE SLABS

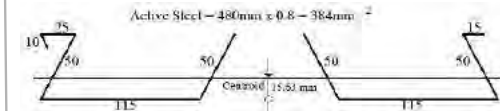
DESIGN TABLES: 300 MM SLAB



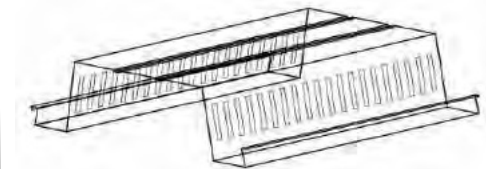
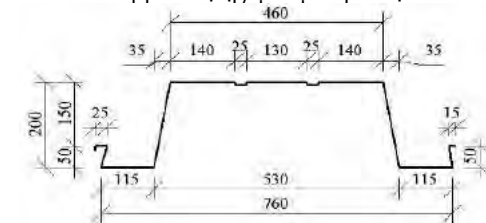
	Area of Reinforcement $f_y = 230\text{N/mm}^2$ $f_y = 450\text{N/mm}^2$	Moment of Resistance $M_r =$ $0.87 \times f_y \times A_{s_xz}$	Total Factored Uniformly Distributed Superimposed Load					
			1.5kN/m ² $W_u =$ 8.37	2.5kN/m ² $W_u =$ 9.97	3.0kN/m ² $W_u =$ 10.77	4.0kN/m ² $W_u =$ 12.37	5.0kN/m ² $W_u =$ 13.97	7.5kN/m ² $W_u =$ 17.97
VP 200	384	27.298	5.11	4.68	4.50	4.20	3.95	3.49
+ 1xY8	50.3	34.294	5.73	5.25	5.05	4.71	4.43	3.91
+ 1xY10	78.5	38.216	6.04	5.54	5.33	4.97	4.68	4.12
+ 1xY12	113	43.015	6.41	5.88	5.65	5.27	4.96	4.38
+ 2xY10	157	49.134	6.85	6.28	6.04	5.64	5.30	4.68
+ 1xY16	201	55.254	7.27	6.66	6.41	5.98	5.63	4.96
+ 2xY12	226	58.731	7.49	6.87	6.61	6.16	5.80	5.11
+ 3xY10	236	60.122	7.58	6.95	6.68	6.24	5.87	5.17
+ 3xY12	339	74.448	8.44	7.73	7.44	6.94	6.53	5.76
+ 2xY16	402	83.210	8.92	8.17	7.86	7.34	6.90	6.09
+ 4xY12	452	90.165		8.51	8.18	7.64	7.19	6.34
+ 3xY16	603	111.166			9.09	8.48	7.98	7.04
+ 2xY20	628	114.644				8.61	8.10	7.14
+ 4xY16	804	139.123					8.93	7.87
Maximum Span (L) in m								

Design Parameters and Assumptions

- Steel : 0.8mm ISQ230 (Galv. Z275)



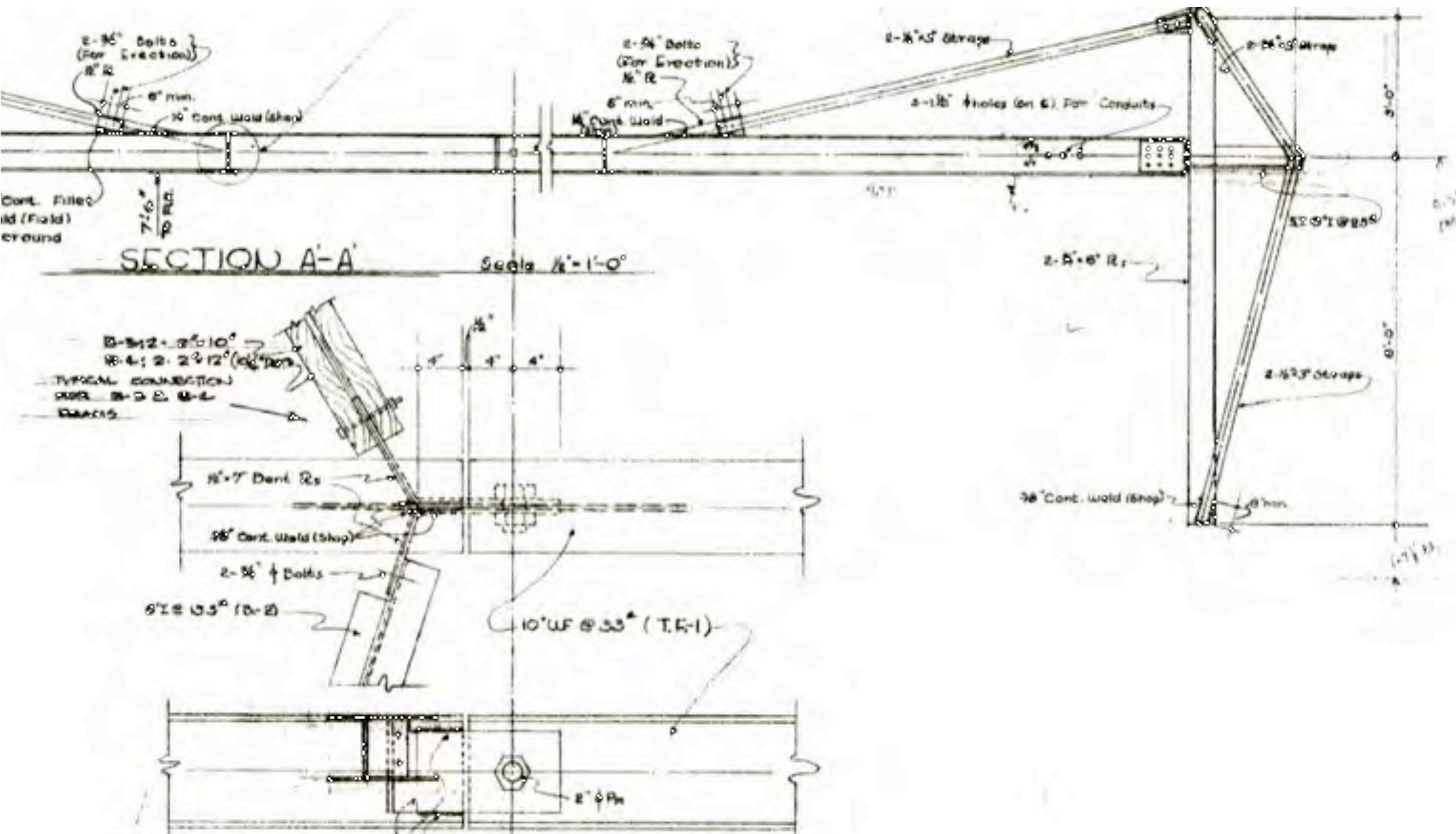
- Concrete volume : 0.17m³/m²
- Temporary propping to be at 1,5m centers.
- Deflections are not calculated but are controlled by restricting the span to effective depth ratios in accordance with the Code of Practice.
- **N.B.** All tabulated values serve as a guide only, and should be certified and



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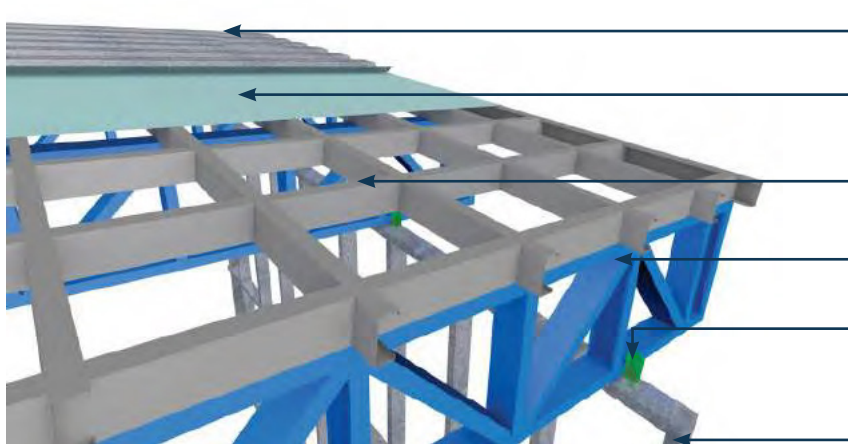
VOIDCON GROUP

ROOFS



ROOFS: SHEETING CONSTRUCTION DETAILS

TYPICAL JOIST ROOF ON A LIGHT STEEL FRAME PANEL



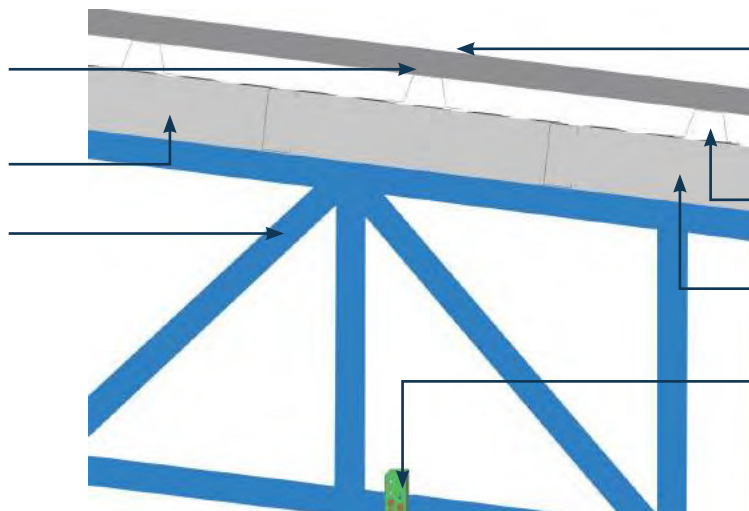
- Brownbuilt Kliplock Roof Sheetting
- Monier Undertile Waterproof ing Membrane
- Light Steel Frame Roof Panels in a 400 mm x 400 mm Grid
- Light Steel Frame Roof Joist
- FrameCAD Tri-Fix Bracket (Left & Right Handed)
Fixture: Self-drilling Wafer Head Stitching Screws
- Light Steel Frame Roof Joint



Tri-Fix Bracket to Roof Panel
Kare Industries Wafer Head Screws
SD1016W2Z3FP 4.8x16 mm

- 40 mm Top Hat Section
with 38 mm IBR – 78 mm
- 89 mm Light Steel Frame Panel 350
- mm Light Steel Frame Roof Joist

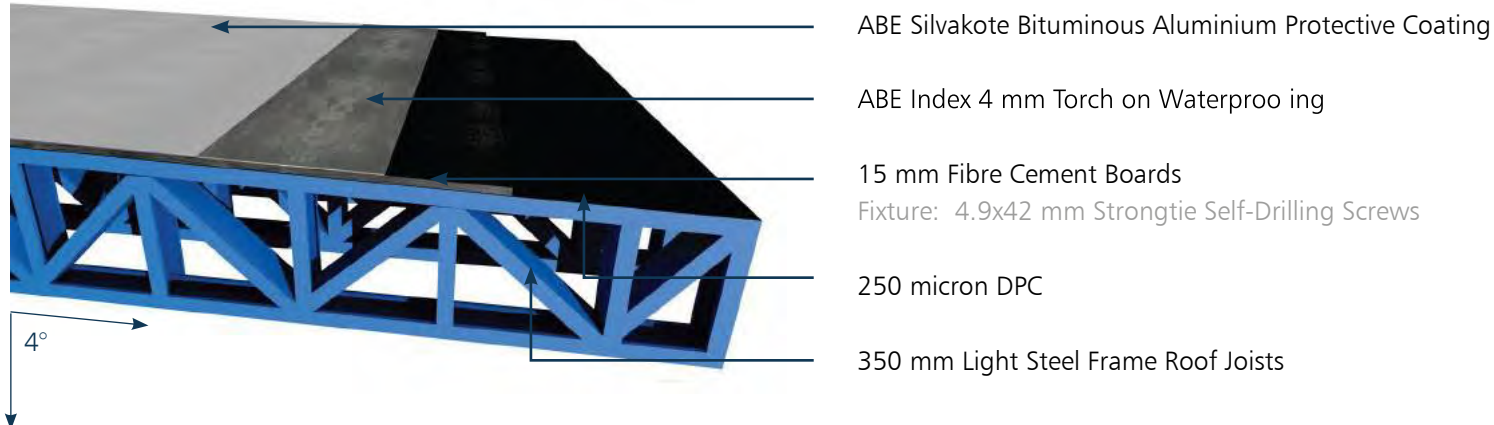
Structure Height: 517 mm



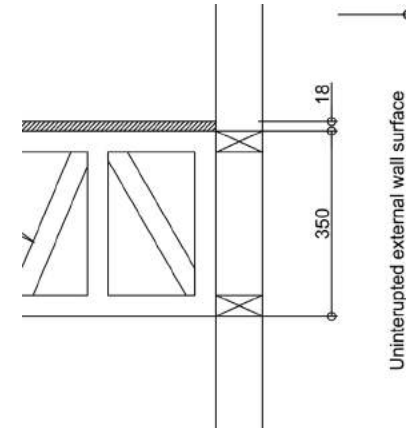
- Cliplock Roof Sheetting
- Monier Undertile Waterproof ing Membrane
- 40 mm Top Hats as Purlins
- Light Steel Frame Roof Panels
400 mm x 400 mm Grid
- FrameCAD Tri-Fix Bracket (Left & Right Handed)
Fixture: Self-drilling Wafer Head Stitching Screws

ROOFS: FC BOARDS SHEETING CONSTRUCTION DETAILS

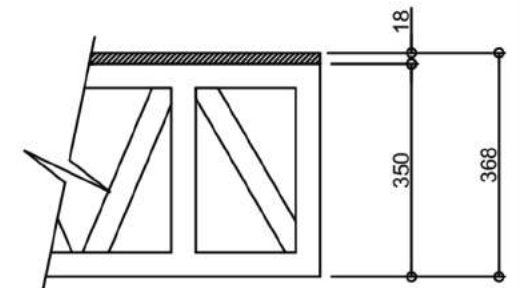
TYPICAL JOIST ROOF ON A LIGHT STEEL FRAME PANEL WITH 18 MM FIBRE CEMENT BOARDS



Structure Height: 355 mm
Maximum Pitch: 4°



Light Steel Frame Floor Joist Fixed on Top of a Light Steel Frame Wall Panel



Light Steel Frame Floor Joist Fixed on the Internal Face of a Light Steel Frame Wall Panel

STEPS FOR PLAN APPROVALS



STEPS FOR PLAN APPROVALS

NEW LIGHT STEEL FRAME ARCHITECTURAL PLANS



STEP 1:

Contact Futurecon to receive wall and floor options to add to the details on the plan.

The following will be e-mailed, depending on which option the customer / architect & Futurecon has agreed to:

- Wall Dimensions
- Roof Truss Dimensions
- R-Value per Wall Sub-assembly
- R-Value for Foundations – Modular Foundation System at 0.5 R-Value
- Decibels per Wall Sub-Assembly
- Detail of Different Wall Sub-Assemblies
- Fire Ratings per Wall Sub-Assemblies
- Details of Floor Sub-Assemblies
- Fire Ratings per Floor Sub-Assemblies
- Heights of Different Floor Sub-Assemblies



STEP 2:

Architect does SANS 10400 XA Calculations on the received R-Values



STEP 3:

Architect e-mails Architectural Plans to Appointed Engineer for Rational Design



STEP 4:

Appointed Engineer e-mails Rational Design back to Architect



STEP 5:

Architect takes Rational Design with Completed Architectural Plans to Council for Submission

STEPS FOR PLAN APPROVALS

ALREADY APPROVED BRICK & MORTAR ARCHITECTURAL PLANS

OPTION 1: Some municipalities accept only rational designs with architectural plans.

OPTION 2: Some municipalities require that the brick & mortar plans are redrawn on light steel frame plans.



STEP 1:

Architect to E-Mail Existing Brick & Mortar Plans in DWG Format



STEP 2:

Appointed Engineer E-Mails Rational Design to Architect



STEP 3:

Architect redoes the SANS 10400 XA Calculations



STEP 4:

Fire rating to be handed in at the council's Fire department to confirm fire rating for the chosen wall sub-assembly – requested by the SG Architect



STEP 5:

Hand in all of the above at the council again – usually 7-10 days for final approval



CONTACT INFORMATION

**WE OPERATE ALL THROUGHOUT SOUTHERN AFRICA WITH
OFFICES IN GAUTENG AND THE WESTERN CAPE**

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