

MF CEILING SYSTEM

FIRE RESISTANT 1 & 2 HOURS

INSTALLATION MANUAL

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RISK ASSESSMENT RECOMMENDATIONS*

Hazard	Safety Controls
General health & safety	1. Installer should be informed of specific health and safety requirements in context via joining Instructions.
Hand tools	1. All workers should be properly trained regarding tools and provided with hand tools that meet relevant safety requirements. 2. Tools should be inspected by supervisors at regular intervals & damaged/defective tools to be taken out of use immediately. 3. The installer is instructed by joining instructions and provided with all necessary PPE.
Power tools	1. Site Supervisor to provide training & demonstration on power tools operation & safety. 2. Cables should be routed away from aisles and walkways where they could create trip hazards to other persons. 3. Periodically check tools for damage/defects and where necessary take out of action and label "Do not use".
Manual handling	1. All materials to be stored in approved and agreed locations within a working area. 2. Forklift truck/pallet truck to be provided for transport of large pallets and waste skips. 3. PPE to be worn when mixing plaster, this includes goggles, dust mask, overalls, safety shoes.
Working at height	1. Demonstration by a certified individual in the safe use of: erection, securing, stabilizing steps, hop ups, trestles. 2. Provision of safe means of access to steps, hop ups, trestles. 3. Use of warning signs at all access points to the work area where work is being carried out above ground level.
Materials	1. All materials are stored in an approved location within a working area 2. MSDS to be displayed in the storage area. 3. Site Supervisor to instruct / explain the safe handling of materials. 4. The worker informed of personal hygiene requirements, wash hands after use/contact and before eating, drinking, and smoking.
General house keeping	1. Worker given verbal instructions to maintain clean/tidy up individual workplaces during and after work times. 2. Tools/equipment to be stored in lockable toolbox. 3. Wet/damp sweeping techniques to be used for general cleaning of work area to control dust levels.

* It is the sole responsibility of the contractor to conduct an appropriate risk assessment for the site.

STORAGE

RECOMMENDATIONS

Mada Plus Plasterboards shall be stored in a warehouse or other suitable structure where they will not be exposed to inclement weather or to temperatures that frequently exceed 52°C. Stacks of Mada Plus Plasterboards shall be stored supported evenly on a firm, dry, level, and structurally sound floor. Gypsum board shall always be stored flat. Stacks of Mada Plus Plasterboards shall be limited to a maximum height of 5 m.

Mada Plus Plasterboards shall not be stored in areas of excessive humidity nor shall they be stored beneath overhead equipment which may have a tendency to drip grease, oil, or water. Mada Plus Plasterboards shall not be left in heavy traffic areas or where they can be damaged by lift trucks and other warehouse equipment, nor shall they be stored at aisle intersections. If Mada Plus Plasterboards are stored at aisle junctions, corner protectors constructed of sheet metal or similar suitable materials shall be used.

Most plasterboard panels are sensitive to moisture and should not be stored outdoors without complete protection from the weather conditions.

The plastic covering provided for product protection during shipment on flatbed trucks is not suitable for storage of the Mada Plus Plasterboards and shall be removed upon arrival at the destination prior to warehouse storage. Failure to remove this plastic covering can result in damage to the Mada Plus Plasterboards due to moisture, condensation, wet product, and/or mold.

Metal products are available in both pack and sub-pack quantities and should be handled in accordance with the recommendations contained in Local Health and Safety at Work Principles and Practices.

Store metal products away from airborne contaminants such as acid or salt spray in an environmentally friendly area.

Storing gypsum board on Job Sites

- Mada Plus Plasterboards placed on a job site shall be separated by type (place the type of products near areas where it will be installed. This system of placement reduces the chance that the wrong type of Mada Plus Plasterboards will be installed and applicators / installers will have easy access to the stocked products.)
- Do not place longer-length Mada Plus Plasterboards sizes on top of shorter lengths.
- Mada Plus Plasterboards shall be stocked out of the way of construction traffic.
- Special care shall be taken to ensure that the Mada Plus Plasterboards doesn't damage the exposed studs, windows, door frames, etc.
- Mada Plus Plasterboards shall be stockpiled so as not to hinder the work of construction tradesmen.
- Mada Plus Plasterboards on a job site shall never have any other materials stored or stacked on top of them.
- Mada Plus Plasterboards shall be stockpiled so their weight is evenly distributed, and the floor is not overloaded.
- Mada Plus Plasterboards shall not be stacked high enough to pose a danger from toppling.
- Mada Plus Plasterboards stored in unenclosed buildings shall be placed far enough inside so that they are not exposed to inclement weather, such as wind blown rain or snow..
- Special care is necessary when stockpiling upper floors of open buildings during periods of high winds.

Metal storage

- Products are supplied in pack and sub-pack quantities and should be handled in accordance with the recommendations of Health and Safety at Work Principles and Practice.
- Where mechanical lifting or moving equipment is required, trained and licensed operators are to be used.
- Metal products should be stored in an environmentally-friendly area away from airborne contaminants such as acid and salt sprays.

MATERIAL HANDLING

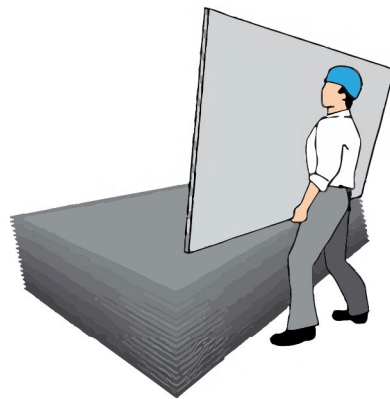
Handling Boards

One person

- Eye protection, Hard Hat and Safety Shoes required
- Pull the board in towards yourself
- Bend your knees for low level work
- Lift by pushing with your legs

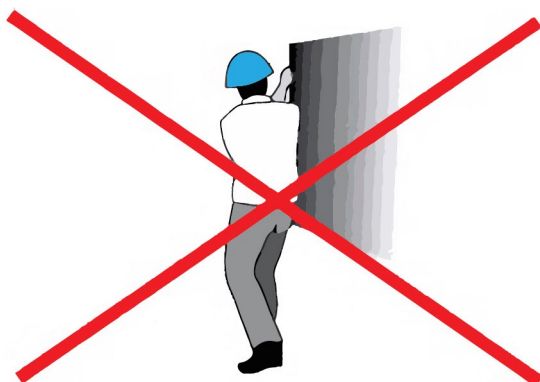


- Carry the board in a balanced manner (for large Boards, you can support the board on the top of the chest / shoulder)
- Only lift what you feel you can manage
- If necessary, seek assistance



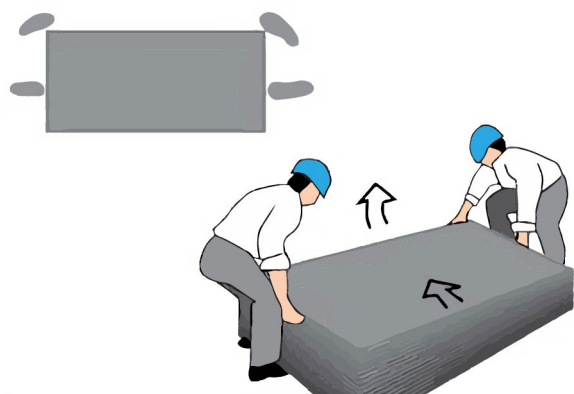
- Carry in a balanced manner across your body
- If walking backwards, ensure it is over the shortest possible distance and clear the route beforehand.

DO NOT CARRY HEAVY OBJECTS ON ONE SIDE



Two people

- Operate from the corners of the stack
- Bend your knees for low level work
- Lift board together to vertical position
- Only lift what you feel you can manage



MATERIAL HANDLING

Lifting Plasterboards Into Place

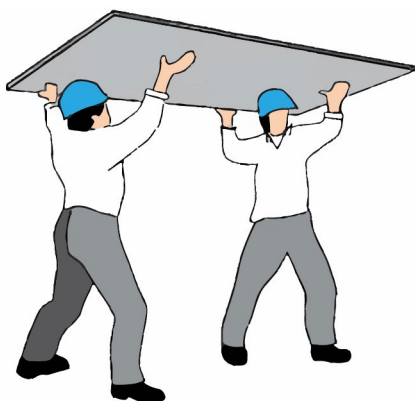
Two person operation

- Eye protection, Hard Hat and Safety Shoes required
- Communicate
- Work together
- Take a firm grip of the board in both hands



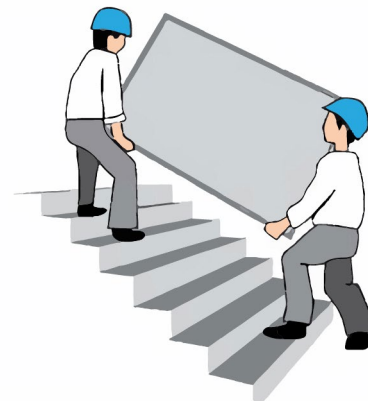
Bend your knees to place board in position

- Always work in front of the body



Carrying board up / downstairs

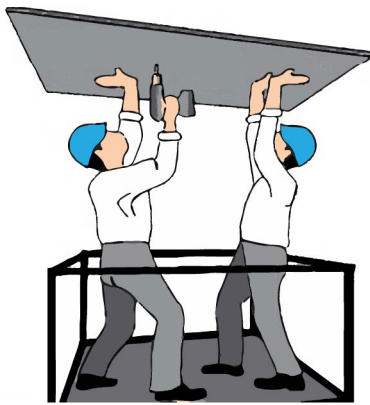
- Eye protection, Hard Hat and Safety Shoes required
- Whether going up or down stairs, place one foot forward then bring both feet together on each step
- Keep the boards in a balanced manner
- Place both feet on each step before moving off to improve control and balance through-out the lift
- Work together in synergy
- Stop whenever necessary (if steps are in poor condition or have a deeper drop, you may need to place the load down first)
- Only lift what you feel you can manage



MATERIAL HANDLING

Fixing Ceilings

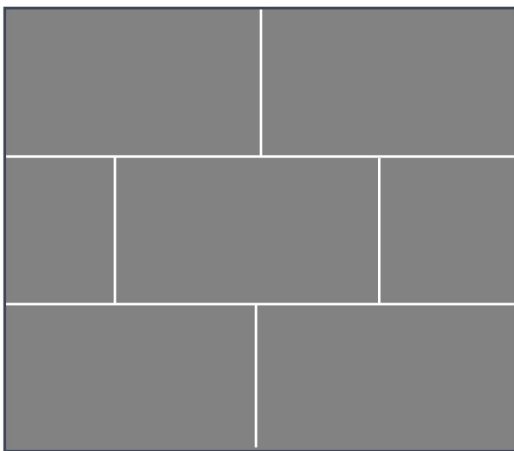
- Eye protection, Hard Hat and Safety Shoes required
- Always work in a balanced position
- Operate with one foot forward
- Keep the body upright
- Always use appropriate platforms where necessary



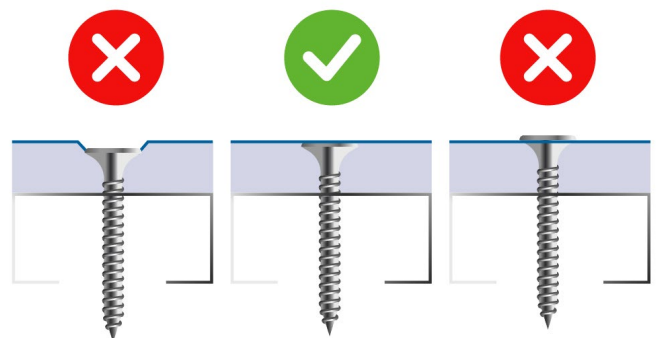
DO NOT OVERREACH



Staggering - Detail

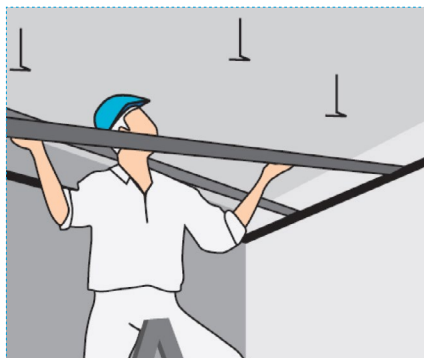
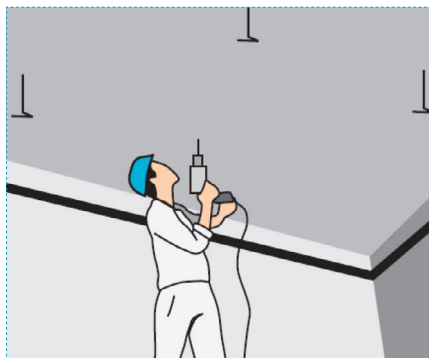


Screw Head Fixing - Detail



SEQUENCE OF INSTALLATION

1 HOUR



Step 1 - Marking

Mark the position of the ceiling line (deducting the thickness of the boards) with a Chalk Line. Fix Mada Wall Angle or Mada Shadow Gap Angle as per Mada project proposal along the perimeter (at maximum 600mm centers and 50mm from end of channel).

Step 2 - Ceiling Suspension

Drill suitable holes for Grid suspension as per Mada proposed measurements or equivalent (e.g., 900mm x 1200mm). Insert & fix the proposed drop-in anchor in the drilled hole, fix it firmly (minimum pull-breaking load capacity of the fixing is 1.20 kN). Fix the Threaded Rod of size suitable to fit in the drop-in anchor and tighten. Threaded Rod length should be based on the ceiling drop.

Step 3 - Ceiling Main Channel Installation

Position Mada Main Channel along the suspended Threaded Rod and fix the Mada Main Channel to the suspension rod using C-Clamp as per the technical proposal using hexagonal nut to lock. The Mada Main Channel (38x12x12mm) runners are positioned not more than 300 mm from one end wall, terminated 25mm (clearance) from the perpendicular wall. The Mada Main Channel grid spacing should be maintained as per the suspension grid spacing specification.

Step 4 - Furring Channel

Mada Furring Channel (70x35x22mm) to be fixed at 400mm centers running perpendicular to the Mada Main Channel. Mada Furring Channel are secured to each Main Channel using two appropriate Mada metal-to-metal fixings (as defined in the Mada project proposal).

Framework is ready for inspection before installation of insulation and boarding. Once required quality control approvals are complete, the following steps can be taken.

Step 5 - Installation of Insulation

Mada Approved Insulation minimum 50mm Rockwool 40 kg/m³ to be laid above the Mada Main Channel. See Insulation Installation Section for more information.

Step 6 - Fixing Plasterboard

Upon Clearance from Main Contractor/Consultant, board lining should be done. Mada Plus Plasterboards will be fixed with Mada Plus Drywall Screws at 200mm centre distances to Mada Furring Channels on board edges or ends for external Layer [for internal layer 400mm centre]. Select right length of the screws so that the screw gives a nominal 10mm penetration into the metal. Take care to ensure the correct depth when fixing the boards. Fixings are to be flush into the board without becoming recessed. See Detail below. Mada Plus Plasterboards shall be cut by scoring and breaking or by sawing. When cutting by scoring, the face paper shall be cut with a utility knife. Mada Plus Plasterboards shall be broken by snapping boards in the reverse direction, then cutting the back paper with a utility knife.

Step 7 - Perimeter Sealant

Apply a minimum of 8 mm square bead of Sealant around the perimeter of the ceiling as well as around penetration cut-outs as per the typical detail drawings.

SEQUENCE OF INSTALLATION

2 HOURS

Ceiling Level Marking

Step 1 - Marking

Mark the position of the ceiling line (deducting the thickness of the boards) with a Chalk Line. Fix Mada Wall Angle or Mada Shadow Gap Angle as per Mada project proposal along the perimeter (at 600mm centers and 50mm from end of channel).

Step 2 - Ceiling Suspension

Drill suitable holes for Grid suspension as per Mada proposed measurements or equivalent (e.g., 1200mm x 1200mm). Insert & fix the proposed drop-In anchor in the drilled hole, fix it firmly (minimum pull-breaking load capacity of the fixing is 1.20 kN). Fix the Threaded Rod of size suitable to fit in the drop-in anchor and tighten. Threaded Rod length should be based on the ceiling drop.

Step 3 - Ceiling Main Channel Installation

Position Mada Main Channel along the suspended Threaded Rod and fix the Mada Main Channel to the suspension rod using C-Clamp as per the technical proposal using hexagonal nut to lock. The Mada Main Channel (38x12x12) runners are positioned not more than 300 mm from one end wall, terminated 25mm (clearance) from the perpendicular wall. The Mada Main Channel grid spacing should be maintained as per the suspension grid spacing specification.

Step 4 - Furring Channel

Mada Furring Channel (85x50x22mm) to be fixed at 400mm centers running perpendicular to the Mada Main Channel. Furring Channel secured to each Main Channel using two appropriate Mada metal-to-metal fixings (as defined in the Mada Project Proposal).

Framework is ready for inspection before installation of insulation and boarding. Once required quality control approvals are complete

Step 5 - Installation of Insulation

Mada Approved Insulation minimum (50mm Rockwool 40 kg/m³) to be laid above the Mada Main Channel. See Insulation Installation Section for more information.

Step 6 - Fixing Plasterboard

Upon Clearance from Main Contractor/Consultant, board lining should be done. Mada Plus Plasterboards will be fixed with Mada Plus Drywall Screws at 200mm centre distances to Mada Furring Channels on board edges or ends for external Layer [for internal layer 400mm centre]. Select right length of the screws so that the screw gives a nominal 10mm penetration into the metal. Take care to ensure the correct depth when fixing the boards. Fixings are to be flush into the board without becoming recessed. See Detail below. Mada Plus Plasterboards shall be cut by scoring and breaking or by sawing. When cutting by scoring, the face paper shall be cut with a utility knife. Mada Plus Plasterboards shall be broken by snapping boards in the reverse direction, then cutting the back paper with a utility knife.

Step 7 - Perimeter Sealant

Apply a minimum of 8 mm square bead of Sealant around the perimeter of the ceiling as well as around penetration cut-outs as per the typical detail drawings.

Step 8 – Secondary Framing

Mada Furring Channel (70x35x22mm) to be fixed at 400mm centers running perpendicular to the boarded Mada Furring Channel. Mada Furring Channel secured to each steel section using two Mada Hex Head Self Drilling Screws (or other suitable fixing as defined in the Mada project proposal).

Step 9 – Secondary Boarding

Upon clearance from main contractor/consultant, board lining should be done. Mada Plus Plasterboards will be fixed with Mada Plus Drywall Screws at 200mm centre distances to Mada Furring Channels on board edges or ends for external Layer [for internal layer 400mm centre]. Select right length of the screws so that the screw gives a nominal 10mm penetration into the metal. Take care to ensure the correct depth when fixing the boards. Fixings are to be flush into the board without becoming recessed. See Detail below. Mada Plus Plasterboards shall be cut by scoring and breaking or by sawing. When cutting by scoring, the face paper shall be cut with a utility knife. Mada Plus Plasterboards shall be broken by snapping boards in the reverse direction, then cutting the back paper with a utility knife.

Step 10 – Secondary Perimeter Sealant

Apply a minimum of 8 mm square bead of Sealant around the perimeter of the ceiling as well as around penetration cut-outs as per the typical detail drawings.

INSTALLATION METHOD

CEILING WALL INSULATION

Insulation (if required by Mada project proposal)

The Installation method is prepared in general to provide basic steps while installing Mada Insulation with in Dry Wall steel structural frame. Depends on actual site conditions the sequence or method can be altered as per Engineer-in-charge.

Basic Tools required

- Measuring Tape
- Utility knife or an insulation saw – a knife with a serrated blade
- Straightedge to cut insulation straight

Protection Equipment

- Work gloves, loosely fitted dress which covers the complete body.
- Safety glasses in case of overhead work
- Disposable dust mask

Material Handling Measures

- Store Mada Insulation material to prevent from damage.
- Remove insulation packaging near the installation site.
- Avoid unnecessary handling or transportation of Mada Insulation material once packaging is removed.
- Do not walk over Mada Insulation Material; It may damage the Insulation and facing.
- To avoid excess dust and loose fiber particles during cutting use sharp knife to cut and use flat surface to keep the material while cutting.
- Cover the open insulation surface during night to prevent the dew droplets fall over insulation at places where humidity level is higher.
- Keep the workplace clean and remove the cutouts and left out unused pieces immediately after to garbage bin.
- In confined spaces make necessary arrangement of ventilation.

Ceiling Installation Method

Once Mada ceiling frame is completed as described earlier and approved as required, installation of Mada Insulation shall be as follows.

1) Site Preparation:

- i. Clean the surface thoroughly to ensure it is free from dust, rust and any foreign particles.
- ii. Remove any protrusions from the installation surface.

2 Application of Mada Insulation:

- i. Lay Mada Insulation (thickness and density as detailed in the Mada project proposal) over the Mada Furring Channel
- ii. Ensure all joints are butted tightly together with no gaps.
- iii. Make a snug fit application near any penetration or openings.

Continue installation as per Ceiling guidance.

GENERAL DETAILS

Framing & Board Fixing Detailing

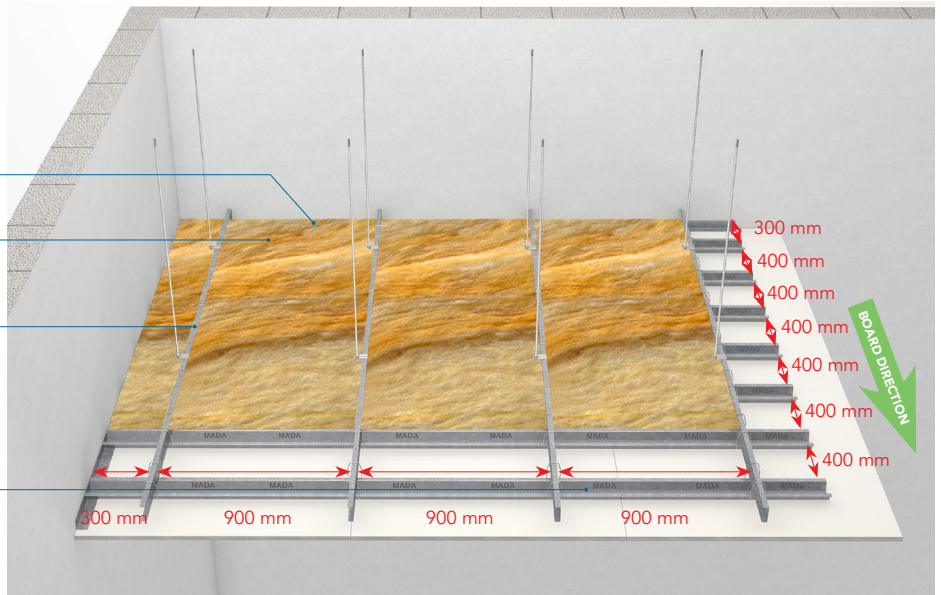
Fire Resistant - 1 Hour

Mada Perimeter Wall Angle

Mada Furring Channel positioned not more than 300mm from one end wall

Mada Main Channel 38x12x12 mm positioned not more than 300mm from one end wall

Mada Furring Channel @ 400mm center to center (or equivalent based on Mada Proposal)



Framing & Board Fixing Detailing

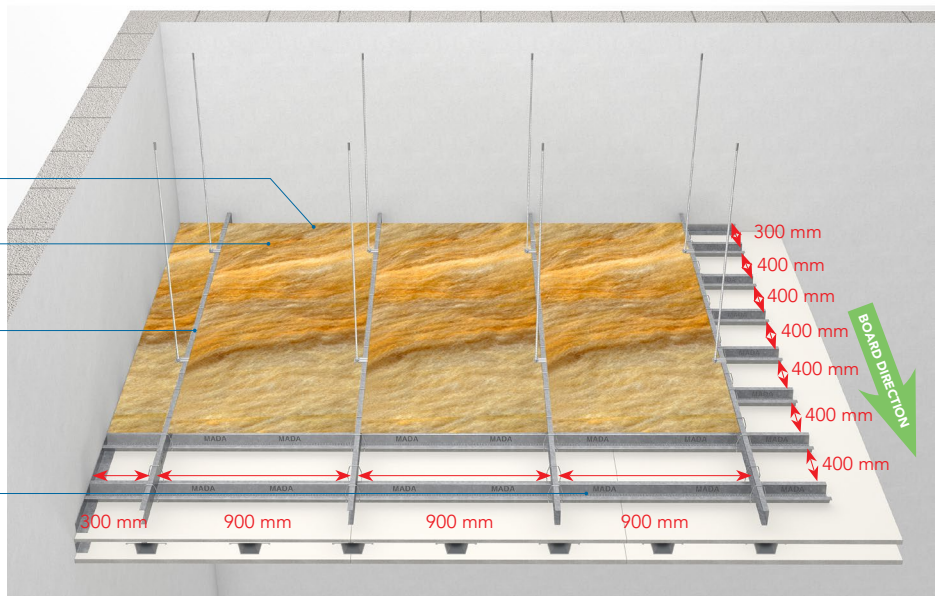
Fire Resistant - 2 Hour

Mada Perimeter Wall Angle

Mada Furring Channel positioned not more than 300mm from one end wall

Mada Main Channel 38x12x12 mm positioned not more than 300mm from one end wall

Mada Furring Channel @ 400mm center to center (or equivalent based on Mada Proposal)



JOINTING & FINISHING WORKS

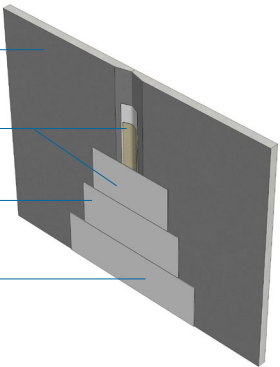
Tapered Edge Board Jointing

Mada Plasterboard

Bedding coat (150mm) using Mada tape bedded in to Mada All-Purpose Jointing Compound

Second coat (200mm) of Mada All-Purpose Jointing Compound feathered out 50mm to 60mm beyond bedding coat

Third coat (300mm) of Mada All-Purpose Jointing Compound feathered out 50mm to 60mm beyond bedding coat



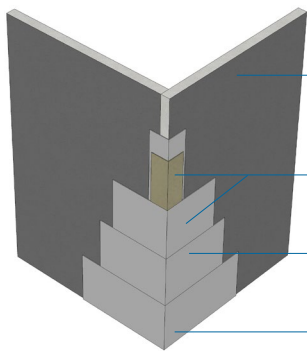
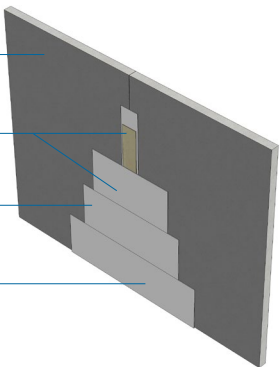
Square Edge Board Jointing

Mada Plasterboard

Bedding coat (300mm) using Mada tape bedded in to Mada All-Purpose Jointing Compound

Second coat (400mm) of Mada All-Purpose Jointing Compound feathered out 50mm to 60mm beyond bedding coat

Third coat (500mm) of Mada All-Purpose Jointing Compound feathered out 50mm to 60mm beyond second coat



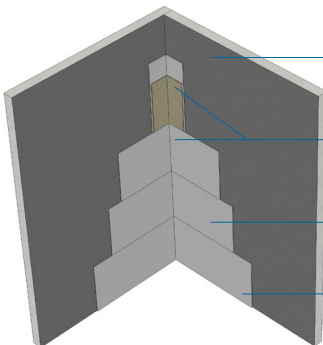
External Corner Joints

Mada Plasterboard

Bedding coat (150mm each side) using Mada Metal corner tape bedded in to Mada All-Purpose Jointing Compound

Second coat (200mm each side) of Mada All-Purpose Jointing Compound feathered out 50mm to 60mm beyond bedding coat

Third coat (300mm each side) of Mada All-Purpose Jointing Compound feathered out 50mm to 60mm beyond second coat



Internal Corner Joints

Mada Plasterboard

Bedding coat (100mm each side) using Mada tape bedded in to Mada All-Purpose Jointing Compound

Second coat (125mm each side) of Mada All-Purpose Jointing Compound feathered out 50mm to 60mm beyond bedding coat

Third coat (150mm each side) of Mada All-Purpose Jointing Compound feathered out 50mm to 60mm beyond second coat



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